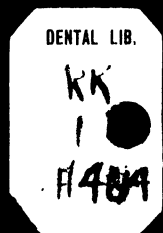
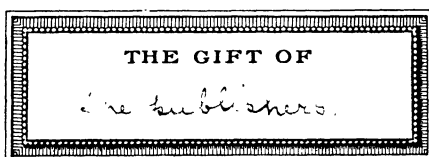
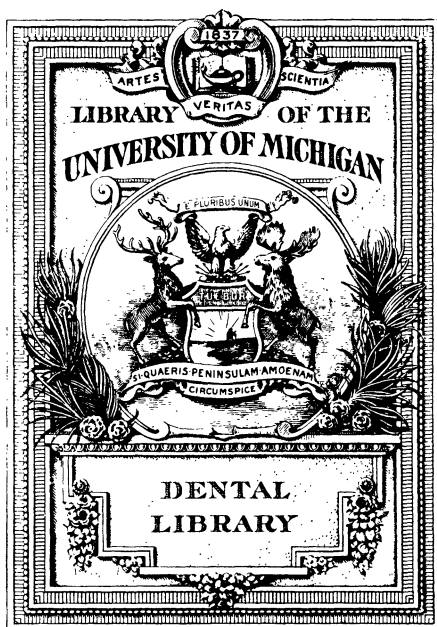


AMERICAN  
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JOURNAL

9

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# *The* AMERICAN DENTAL JOURNAL

DR. BERNARD J. CIGRAND, Editor

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## *Editorials and Comments*

"The editor assumed charge of this journal with the signed understanding that he shall have absolute and unlimited control and supervision of the editorial and literary elements; this unusual grant makes it possible to render the profession an independent peri-

odical; the title page clearly indicates the scope under new policy of this old established journal."—*Publishers.*

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### THE STATE, BI-STATE, TRI-STATE, MULTO-STATE AND NATIONAL CLINICS ARE ILLEGALLY OPERATED.

The various state clinics as now conducted are illegal; the bi-State and the Multi-State Clinics are in the Same Irregular Attitude. and the national clinic is operated contrary to the laws of the land.

Much as this journal dislikes to bring trouble or anxieties to the various officials of these great organizations, it is the purpose of the AMERICAN DENTAL JOURNAL, as announced and published upon the cover page of all issues: to assist in advancing the art and science of dentistry, aiding in elevating the plane of dental organizations, supporting the state boards of dental examiners, and seven other primal principles. Hence in accord with these determined policies, this dental periodical will in this issue, and continue, to direct attention to the illegality of dental clinics until the laws are changed or the state boards, by resolution, give a legal right to the state or interstate clinics.

The reader will doubtless be astonished at the declaration that not a single state society or prominent local society in the United States conducts its clinics in a legal manner, but this statement, without its supporting proof, would be mere burlesque; hence in the subjoined sentences take notice that the charge is correct.

In order not to tread upon any reader's toes, nor to implicate any practitioner, permit the editor to relate the case incorporating his personality in evidence of the inadvertent or unthinking violation of the dental law, as operative in several states to be quoted.

In the spring your editor gave a clinic at the Southwest Michigan Dental Society; in the summer he gave a clinic at the Wisconsin State and New Jersey State societies.

Being licensed in Illinois and registered in Cook County (Chicago), what authority had your editor in engaging in a clinic in Michigan, Wisconsin or New Jersey? The answer: No right whatever! Papers he read at these gatherings were permissible, but the performing of dental services was absolutely contrary to the laws of these respective states. Any citizen might have sworn out a warrant and had the operator placed under arrest and imprisoned, or fined the violator, according to the provisions of these state laws.

Now, what applies to the editor of the AMERICAN DENTAL JOURNAL is equally applicable to hundreds of other practitioners in the land. The City of Chicago, the metropolis of New York, and scores of large local societies have during the past year given dental clinics at which distinguished dentists of the neighboring states were the honored operators. What right, what authority, had these willing and well-meaning dentists to perform operations on patients of these states when they were without the proper legal certificate entitling them to practice dentistry? The answer is clear. These practitioners were without legal right, and officers of the municipality and members of the community could have brought a shock to the operators and disgrace to the profession by having such placed under arrest. The fact that a state society invites you does not admit of a violation of the law.

Contemplate the situation! Drs. G. V. Black, E. C. Kirk, R. Ottolengui, performing a dental operation before some distinguished gathering in a state where they are not registered as legal practitioners, and while in this honored capacity, serving in an eminent, educational and clinical manner, approached by an authorized state official and placed under arrest. Imagine the shock to the famed guest! Picture

the excitement of the scene in the amphitheater, with its hundreds of interested spectators, and contemplate the humiliation and almost unanswerable public and professional remorse.

Yet this, fellow practitioners, is the state of affairs as pertains to your dental clinics as now conducted from one end of the land to the other. Men cry out, "enforce the laws!" "Put violators under arrest!" Fine every practitioner whose name is not on the state board books!" This sounds good, has a ring of dare in it, seems patriotic and law-abiding, but if these same declarations were put into actual effect, it is doubtful if any prominent practitioner in the United States would have escaped the prison, jail or police station, during the year 1910.

The National Dental Society at Denver was no exception to this rule. Mark the facts. Denver is in the State of Colorado, if the editor mistakes not, hence the Colorado State Dental Law is the supreme edict of that part of the national geography. What does that law happen to require? Correspondence with the State's Attorney's office brings the information that: "The only way in, or condition upon, which a dental practitioner can perform dental operations in the State of Colorado is to obtain a license by presenting a diploma from a recognized institution and submitting to an examination, satisfactorily passed." How many of the distinguished clinicians before performing their operations at the National Dental Association went to the trouble and expense of thus legally preparing themselves for the national clinic? Only those who actually were listed on the State Dental Board books—is your answer. That is not correct. The only practitioners entitled to give a clinic at Denver were such Colorado dentists as were registered on the county books of Arapahoe County. All others who were practitioners of other counties of Colorado were illegal practitioners at Denver because of their non-registration, hence a fine mess for the great army of honest, earnest and good-meaning clinicians to get into. The law does not allow or excuse because of ignorance of the law, and what a disturbance might have been witnessed at that great and memorable gathering. Our own good, honored friend, Burton Thorpe Lee, the president of the National Dental Association, might have had that great misfortune. He would have eagerly assisted at any operation—all without a license—and the likelihood of arrest and imprisonment were very possible. A wonderfully unwarranted condition for a profession to be exposed to. In that same City

of Denver Dr. T. W. Brophy performed, in the presence of oral surgeons, his original method of cleft of palate correction by surgical procedure. What would the world have said had he, during or after the operation, been subjected to the sting of arrest for practicing without a license.

Europe especially would comment on the strange relationship existing regarding government recognition of medical and legal specialists. This situation should be corrected. How can it be remedied? Easily enough. A campaign that shall reach throughout the states advocating the issuance of a license to all who expect to give the clinic in another state. The state board would issue this temporary professional license to cover a week or ten days, thus legally covering the point and making the interstate or national clinic not only possible, but legal.

If the clinicians were to be charged for this "temporary clinical license," let the society pay that fee.

During this coming winter many are the interstate clinics which will be held, and pending the likelihood of the arrest of the clinicians it would be wise for the organization to issue a certificate, assume the blame and agree to defray expenses in the event of arrest or legal proceedings. "An ounce of prevention is worth a pound of cure," and a great profession composed of venerable men of learning and studious post-graduates and undergraduates cannot afford to expose themselves to the whims of officials or super-exacting citizens, who might pounce down upon some distinguished gathering and cart so-called unlicensed operators to the lockup.

The remedy the AMERICAN DENTAL JOURNAL hopes to obtain, and thus fortify all clinicians against possible arrest. Besides, this will be the first real step, in the direction of, according dental practitioners, the right to practice in other states; while this is intended for temporary purposes, the campaign nevertheless will be continued, to wage until a practitioner practicing honorably in Maine can, with the payment of a few dollars to the State Board of another state in the Union, change his residence and assume practice anywhere under the stars and stripes.

Let the readers aid in this by sending to the editor their opinions of the righteousness and justice of such a broad and liberal interstate dental registration. The reader may wish to change his professional



DR. JOSEPH LE MAIRE

DENTIST OF NATIONAL RECOGNITION

(From The Cigrand Historical Collection)

(Compliments of The American Dental Journal.)

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residence—because of health or business opportunities—let him aid now.

Not mere reciprocity will suffice, since that word just now has come to mean anything—a variety of definitions are afloat, beclouding the members of the National Dental Examiners Association, as is manifested in banquet orations and discussions recorded in their annual proceedings. Let us have this tangle undone. Why all these years of delay? Who is it that blocks the way to a broad construction of the word dentist? Why must a dignified practitioner who, for say twenty years, has been a deserving citizen, a loyal ethical and dutiful operator, be submitted to an examination either in his studies or his technique when he is a member of a State Society? Is membership in a state organization insufficient? Then raise the bars to admission to the State Society by such qualifications as will warrant the issuance of a certificate as will impel a neighboring State Board to render a license when the necessary fee is paid and entries have been made on the county or state books. There is at present an absolute unfair and unprofessional attitude on this subject.

A person suffering with toothache or requiring dental substitutions demands the same attention whether he lives in Vermont or Nebraska, hence if the operator can relieve the pain or construct the substitute in the one state, he can do likewise in the other. This applies equally with any other part of our national geography. It is not the same with the lawyer, since he must understand the various state laws in order to properly fit him for practice, but the dentist operates on the human system, and this is quite generally the same in all parts of the United States.

What dentists require, in order to be truly honored practitioners, is to have the right to practice anywhere in the land, once he is recognized in any state in the Union.

At the present writing there is not in the United States a so-called nationally recognized dentist. Even the officers of the Army and Navy Dental Board, while they have certain privileges and prescribed authority relative to examining candidates for the practice of dentistry at army headquarters, yet if they should attempt to operate on citizens, the state in which they performed the operation could have them arrested, since their service is not in accord with the letter of the state law. Hence we have not a single individual practitioner who can practice in any section of the nation without submitting to some

form of legal qualification. Some few dentists there are who have registered their diplomas in various states, but this simply illustrates that a few took advantage of the situation before the National Board of Dental Examiners placed in effect a rule preventing registration, without examination, either oral, written, mental or manual, as the case best fits the State Board.

The only, and first person or practitioner, in the United States who possessed the right to practice anywhere in the Union, and who had received such authority from the government, was Dr. Joseph Le Maire, who came to the colonies during our struggle for liberty, as is shown in the following (Cigrand's History of Dentistry, published 1892), on page 166: "In the month of July, 1778, perhaps the darkest period of the American Revolution, the French fleet, with reinforcements, reached our shore. Among the proud French soldiers was one named Dr. Joseph Le Maire, who came expressly to this country to battle for American independence. This patriotic Frenchman, Le Maire, soon became an intimate associate of both Washington and Lafayette, and while fighting with them for the independence of the colonies he often relieved the suffering soldiers of the pangs of odontalgia. Not only did he exercise his skill to secure for the revolutionary veterans freedom from physical suffering, but he, too, seized his sword and shouldered his gun and played an active part in the memorable strife for human liberty. While the French and American armies, in 1781-2, were in winter quarters near Providence, Rhode Island, Dr. Joseph Le Maire, by permission of Count Rochambeau (through the authority of General George Washington), taught the dental art to Joseph Flagg, then eighteen years of age, and James Gardett, aged twenty-five. Le Maire's practice was not limited to the soldiers only, but he did dental operations for the people in the immediate vicinity."

Thus the earliest known public clinics for the purpose of instructing the students or profession was given under national authority, and this commission came from the hands of General Washington. These rights were respected throughout the revolution. Le Maire and his students performed operations on the soldiers and the public as well, regardless of what county or what state they happened to be in at the time. Hence Le Maire was the first person to receive national recognition and to be given the authority to practice dentistry in the United States (not some few square miles in a county border), and this same educated Frenchman was the real founder of the instructional

course in dentistry in the nation, as is proven in the words of the eminent dental scholar, Horace Hayden (page 167, *Ibid*): "The first hints that were afforded or opportunities offered to any person to obtain a knowledge of the profession were, we believe, through a French dentist by the name of Le Maire, who offered his services to the public during the revolutionary war. He likewise undertook to instruct some two or three persons in the profession, which may be considered as the origin or commencement of dentistry in this country."

Now let the ambition of the entire profession be, to be as fully recognized by the nation as were Le Maire and his three dental students. It will afford the *AMERICAN DENTAL JOURNAL* considerable pleasure in inaugurating, with the support of the subscribers and the general practitioners, a campaign for broader and more liberal recognition at the hands of the several State Boards of Dental Examiners. If you believe in a cause, do not sit idly by, but lend not alone your moral support, but contribute, if needs be, your financial aid, as this latter attribute is also an important element in any progressive movement.

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#### COMMENT.

The October issue of the *AMERICAN DENTAL JOURNAL* devoted eighteen pages to the "Professional Arena." This was more than actually should have been allowed, but matter had been accumulating and only by liberal insertion could we catch up to the current correspondence. Practitioners everywhere, and at conventional meetings especially, refer to the lack of opportunities to express their opinion regarding any question under debate. One will say, "I dislike to get up in the convention and discuss the subject. I feel a little timid and was not fully prepared. But I would like to give my views somewhere, somehow." Another will say, "I just cannot get up on my feet and express my thoughts, but I can write my mind perfectly." Still another will say, "That last speaker don't know what he is talking about; he is absolutely wrong. My experience and investigation has taught me differently." Yet these same practitioners will go home from a convention and never impart one single idea as to their methods or their procedures at the chair or in the laboratory. They like to get thoughts from others, they love to gain strength for their own case—but—when it comes to returning the compliment or asserting what they know, some vague excuse is offered, and a quieting pause tells the inquirer that he is one of these "tappers" who loves to get the

goods, but seldom if ever opens his mental faucet for the benefit of anyone else. The excuse in this instance will not suffice. The AMERICAN DENTAL JOURNAL is published for the profession and not the trade; it freely offers its pages for any purpose promisory of dental advancement, and cheerfully extends to its subscribers and non-subscribers the opportunity of expressing their ideas or thoughts on any subject under discussion. If you have a method which gives success to your hands, if you have a procedure which brings comfort to either your patient or yourself, send it in, and designate whether you wish it in the "Special Contributions" or the "Professional Arena," and your pleasure will be observed in the most courteous editorial manner.

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The last few years have brought to our attention the enormous death rate charged up to tuberculosis. It is estimated that 150,000 people annually die in America from tuberculosis. And upwards of one billion dollars are expended and lost because of this illness. The fact that this disease attacks those who are in middle life interests us all the more because it is taking from our midst the very fiber of our commercial and educational system. The great army of people infected from tuberculosis range between the ages of fifteen and thirty-five, while the origin and aggravating causes are subjects of great dispute. It is nevertheless conceded that certain predisposed conditions produce symptoms which are universally indicative of tuberculosis. While the conditions of the mouth have escaped the critical attention of the medical scientist, it nevertheless is deserving consideration in that many ailments we have, physical and mental, trace their origin to disorders of the teeth. We have and are this day and generation giving too little attention to proper mandication and mastication, and observation should teach us that the primary requisites of good health are a properly organized and hygienic masticatory apparatus. In this connection the function of saliva must not be underestimated. Our hasty meals and hurried manner of eating that brings about circumstances that may be the initial cause of tubercular progress. The saliva is an essential intermedium to proper digestion, and if the latter is impaired there can certainly not be normal assimilation. Unless our foods are thoroughly insalivated while in the mouth, the further preparation of our edibles for the important transformation into blood has been impaired; this interference must of necessity beget impoverished circulation.

# SPECIAL CONTRIBUTIONS.

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## A SYMPOSIUM FAVORABLE TO PORCELAIN JACKET CROWNS

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DR. ADOLPH E. SCHNEIDER, CHICAGO.

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In writing this paper I take upon myself the correcting of the false impression many of the profession have, of the unstable qualities of the porcelain jacket crown.

Before and after my clinic, given at Danville, Ill., before the Illinois State Dental Society, May 11-15, 1909, many of the profession of whom I asked an honest opinion with regard to this class of work, spoke of it in very unfavorable terms.

Some mentioned the ill effect of the crown under the gingival border; others the lack of strength displayed; the impossibility of shading or contouring correctly without the shell facing; the impossibility of placing them without devitalization or the bad practice of doing so; claiming that the irritation, consequent to the stripping of the enamel from the tooth, would destroy the pulp; and also that they could not get fees commensurate to compensate them for the hard work necessary to make these crowns.

In answer to the first objections, I wish to say that of all the crowns made, I challenge anyone to show me a crown that will show better margins at the gingiva or have less ill effect upon the soft tissues, than the porcelain jacket crown. In the first place we know that of all materials we use in the mouth, there is none to which the soft tissues take more kindly than to porcelain; and except for the dowel crown, to which we cast a coping and by this I refer to the root prepared with a shoulder such as we use in the root preparation for a porcelain jacket crown, there is none that fit the root so accurately, for it is built to conform exactly to the peripheral contour of the root.

All others either binding the root or else setting flat upon that excised root, the fit of this crown being nothing more than guess work and in my estimation as poor if not the poorest crown the dentist can place in the mouth. Why?

I wish a more thorough study of the deficiency of this crown would be made, as I have studied it by collecting all the extracted

specimens I could get hold of. Considering the fact that we all feel sure the finished work, after placing the dowel crown, is good dentistry and to be commended; I think your sensibilities would be greatly shocked if you could but see the results of this class of work.

It would at least be an object lesson you could not soon forget and I know most of you would hesitate before placing these crowns, especially in the mouths of your dear ones, or would at least be more particular in your technic.

Of all the misfits, the large open joints, the good joints with crowns sometimes twice as large in circumference as the roots upon which they are placed, the poor joints plastered with amalgam to fill up the space between the root and the crown; the split roots and also the roots through which the dentist has drilled to make room for the post and the infinite many with or without *adequate* root fillings; indeed, it is astonishing the number of imperfections manifested in this class of work.

I have saved a few of these specimens and upon showing them to one of our leading prosthetic educators, he tells me that the specimens I have are but a fair average of this class of work that is put out by the dentists of today.

Is this not a sad commentary on the judgment of the dentists of this enlightened era?

If there is any detail in our work that demands more of our most earnest consideration, I think it is the technic of this particular kind of work.

I honestly believe that after a thorough investigation of all crowns you will acclaim without a dissenting voice for the premier of them all, the porcelain jacket crown. As regards its strength, I wish to say that if the technic of this crown is carried out correctly in its minutest detail, and I assure you it is not the easiest of tasks, I verily believe that, all things considered, it is as strong as any of the dowel crowns and I can say with perfect peace of mind that up to the present time I have never had a broken crown come back and of all my patients the ones I hear the most praise from are the ones for whom I have made porcelain jacket crowns.

I do not wish to insinuate that they do not break or that I will not have to replace a crown now and then, but I do maintain that the percentage of breakages, after investigations leading me to the suc-

cessful porcelain jacket crown operators, does not average nearly as high in proportion to the number placed, as in the case of dowel crowns.

I wish here to state that I place about ten porcelain jacket crowns to any one of the other varieties, and in all positions in the mouth, and that is why I am so optimistic with regard to this very high class of work.

I have seen these crowns in the mouths of patients after five, six, seven and eight years of usage, and I can say that it is with much pride and encouragement that I devote most of my efforts to this class of work.

The next objection comes nearer to being just than any of the former, for if there is any one step of this work that demands your most persistent effort and a really artistic aptitude, it is in the contouring and shading of this class of crown, for your effect is never attained until the crown is finally cemented to place.

In building this crown, it is not the numerous colors and their application "en masse" that gives one results in color-building, but the delicate blending of one color upon the other in their various thicknesses. By this I mean it is not necessary to have every color of porcelain made, but I like to use say three or four colors only; mixing them and blending them one over the other, which gives me the most delicate as well as the more somber shades with which we come in contact.

The oil colors come in very handily at times in shading teeth of tobacco users and the opaque and mottled teeth we sometimes come in contact with.

Next comes the question of devitalization.

On this one point we will find many and diversified opinions. Mine is this—and it is another point that I have picked up by examining countless extracted specimens: That I would rather take my chances with a tooth denuded only of its enamel and the pulp intact than one with the pulp removed and be it ever so fine a root filling.

I am not one of those shouting the fact that I never have had a root canal filling give trouble.

My troubles have not been many, but I have had them. More than I have had by leaving the pulp intact, I assure you.

If you will examine the abscessed roots extracted, you will be

surprised again at the peculiar habit roots have of being bent or twisted and in many other ways being malformed, which makes it an utter impossibility for any dentist to properly fill the root canals.

Furthermore, in my investigations I am really surprised at the few pulps that succumb to the irritation consequent in denuding the tooth of enamel.

I myself have never had a bad after-effect.

I remember one case that came under my observation during my investigations, of a dentist, at the time a novice in preparing a tooth for the porcelain jacket crown, where not only the tooth was denuded of enamel, but the pulp almost of dentine, and yet that crown had been worn nearly two years before the patient returned, and then the tooth had broken off at the shoulder.

Taking a burr and expecting to drill to the pulp—devitalize and cast to pin and crown, he was surprised to find that the pulp had receded beyond his ability to grind, unless he wished to go through the end of the root. This has been my experience that the pulp protects itself and is not always the delicate organism we imagine.

So, considering the results a few of us have obtained, I do not feel justified in devitalizing every time I place a porcelain jacket crown.

Lastly with regard to the fees:

Upon this one point do more dentists allow themselves to become discouraged in this work than any of the others. Why? Because they look at the efforts and results of men who have made a failure of this class of work, and consequently they have not the courage of their convictions, a feeling that it *will* be a success in their hands.

Very seldom after demonstrating the superiority of this crown over all others have I ever had a demand for the cheaper grade of work, and they are only too glad to pay the additional fee.

What the general public wish is absolutely your best effort, and even though at times they may complain of the cost, they would never be satisfied with the inferior work once they realized the benefits of your very best efforts.

Considering the results of my investigations and the results in my own practice in the use of this highest branch of the dental art, I cannot but believe that there is a very bright future for the *porcelain jacket crown*.



**SPECIFIC CAUSES OF CARIES AND EROSION IN HUMAN  
TEETH—LOGICAL THEORIES AS TO PYORRHOEA  
OBSTINATE.\***

BY J. OXFORD KELLER, D.D.S., OF CHICAGO.

The word "caries" has long been used by dentists as a name for the common disease known as "rot" in human teeth (and bone). Such terms as "chemical decomposition," "decay," or "disintegration," would seem to the writer of this paper to be more appropriate. The term "caries," however, in deference to the almost universal choice of a term by the dental profession at large, will be generally used in this paper, in the discussion, determining the specific causes of the maladies in question.

Decay of the teeth, tooth rot, commonly known as "caries," more than any other theme in dental science, has engaged the scientific interest and investigation of alchemist, physicists, chemists, dentists and physicians for more than two thousand years.

Numerous theories have been advanced from time to time, concerning the origin of this disease, showing that it is no easy problem. No one of them, not even the theories advanced by Miller and Black, have been universally accepted.

**HISTORY OF UNSUCCESSFUL ENDEAVORS TO GIVE CARIES CAUSES.**

The following are among the leading causes which have been ascribed for carious decompositions:

Depraved juices, disturbances of nutrition, inflammation, worms putrefaction, mortification, chemical dissolution, parasites, electrolytic decomposition, chemico parasitic causes, and neutral salt chemical agencies.

The stagnation of depraved juices in the teeth was first designated by Hypocrates (456 B. C.) as the cause of toothache, preceded by tooth rot.

Krauerman (1732 A. D.) gives a similar explanation as to the cause of caries. Bourdet accepted it (1757). Bell, Serre, Kappis

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[\*The next issue will define the specific classes of chemical agencies producing caries causes: Also natural salts, with their chemical actions and reactions, chemical composition of enamel, dentin, cementum, human bone, human blood, human saliva, and give atomic, molecular and cellular constitution of human teeth; also chemical actions and reactions in acid and alkaline decays, evidences, and proving experiments.]

and others (1794) accuse depraved conditions to be the cause of decay.

Disturbances of nutrition as the cause of decay are alluded to by Calen (A. D. 131). He ascribed loosening of the teeth to an excess of moisture. This view is also held by Aetius (A. D. 550), Avicenna (798) and Serapion (1002).

For many centuries worms were ascribed as caries causes. Scribomis used fumigation against them. Musitanus (year 1114), Krauterman (1732), Ringleman (1824) took similar measures. Pfaff (1756) says worms in the teeth result from defective nutrition.

As early as 125 A. D., Galen mentions inflammation as a cause of tooth decay, excited by excessive nourishment. Joseph Fox (1806 A. D) says decay arises from inflammation. Thomas Bell (1831) says that rot in teeth has its origin in inflammation. Neuman, Kirks and Koecker entertained the same views. In more recent times the inflammation theory was advocated by Abbott, Heitzman and Boedecker.

Pfaff (1760) says worms in the teeth and gums cause putrefaction and decay. Zahnfaule regarded tooth decay as a putrefactive process. Peter Fauchard (1728) made an unsuccessful effort to discover worms in inflamed teeth. Pfaff (1756) says he saw worms in and around inflamed gum margins.

Several years later Pfaff reports that worms in the teeth and gums cause putrefaction. At the same time Zahnfaule regarded tooth decay as a putrefactive process.

Schlenker writes "That rot and decay in human teeth is a purely chemical process. Where there is no acid, no caries is possible." He, however, makes no effort to classify the chemical agencies which may destroy tooth structure.

Robertson (1835) ascribed caries to result from decomposition of lodgements of food on the teeth, in their cavities and interstices.

Regnard of Paris (1838) defined caries as destruction by decomposition.

John Tomes, of London, claimed that inflammation of animal matter of tooth structure, resulting from an acid, which afterward dissolved the mineral salts in consequence, to be the cause of caries. This is known as a chemico-vital theory.

Dr. Magstot, of Paris, claimed that caries is caused by substances developed in the mouth. This is a chemical theory.

#### MICRO-ORGANIC THEORY OF DECAY.

Ficinnis, a German physician, is thought to be first to advocate a microbic agency of decay. Some say Professor Erdl was two years ahead of him. Klenke upheld the parasitic theory. Leber and Rotenstein were first, however, to place the micro-organic theory on a solid basis. Weil, Arkovy, Bastyr and Alfred Gyssi all advocated the chemico-parasitic theory.

The more recent advocates of the microbic theories of decay are Miller, Black, and Kirk. Sudduth says: "Doctor Miller's theory of the formation of cavities by the action of a digestive ferment upon the basic substance of dentin has been the only theory ever advanced that explains the formation of cavities." Pierce says that tooth rot cannot proceed without parasitic life. Leber, of Germany (1867), claimed that micro-organism played a prominent part in dental caries.

#### MILLER AND BLACK'S PARASITIC THEORIES OF DECAYS.

Miller in his book, "Micro-organisms of the Human Mouth," page 105, says: "The action of bacteria upon carbo-hydrates is of the greatest importance to the dentist in particular, to the medical practitioner, and, in fact, to everyone, inasmuch as the origin of decay, with its evil consequences, depends upon it." Page 119, he further says: "The decay of the teeth, the destruction of the hard substances of them by the disease commonly known as caries, decay of the teeth, tooth rot, etc., has, more than any other topic in the domain of dentistry continued to excite the scientific interest of dentists and physicians for more than one thousand years."

Miller says all putrefactive stench means living micro-organisms. In his book on parasitic life, page 103, he says: "Whoever is at all versed in the fundamental principal of bacteriaology would regard it as a matter of course that the process of fermentation going on in the oral cavity offers no exception to the rule (law) that all fermentative and putrefactive processes are conditioned by the presence of living micro-organisms."

Black, in his Operative Dentistry, Vol. 1, page 68, paragraph 1, says: "The enamel with its rods cemented together by its cementing substances, is a solid. It has no natural opening in which micro-organisms can grow; and these have no power of penetration into it,

except as it is dissolved by the acid, which they form during their growth. Therefore, in decay of enamel, the micro-organisms, producing the acids, are on its surface. On the other hand, the dentin is everywhere permeated by dentinal canals into which micro-organisms may grow, when the dentin is exposed by the destruction of the enamel."

In volume 1, page 65, Dr. Black gives a general statement as to caries causes, as follows:

"Caries in its simplest expression consists in a chemical dissolution of the calcium salts of the tooth by lactic acid, followed by the decomposition of the organic matrix."

Black's parasitic theory of decay:

"In this way the tubules become packed full of organisms and the surrounding dentin is always decalcified in advance of the growth of the fungus by the lactic acid produced. That this is the true explanation of the etiology of dental caries, there is no longer any reasonable doubt."

Edward C. Kirk, editor of the Dental Cosmos, is also an advocate of the micro-organic lactic acid theory of decay. In an original paper discussing the problem of susceptibility and immunity to dental caries, in July, 1910, Dental Cosmos, page 732, first column, he says:

"We also know the intimate nature of the process of dental caries to the extent that its bacterio-pathology has been demonstrated by the researches of Miller, which show that tooth decay is the result of the activities of certain bacterial ferments acting upon carbohydrate pabulum in such a way as to convert it into lactic acid, which decalcifies the hard structure of the tooth, exposing its organic matrix, this in its turn being liquefied and further decomposed by other bacterial agencies capable of causing putrefactive decomposition."

Dr. W. D. Miller (an American dentist) at work with Dr. Koch (Berlin) in the latter's bacteriological laboratory, it is claimed, established a means of cultivating micro-organisms found in the mouth and cavities of the teeth, separated them into species and determined the character of each as to acid production and decomposition.

The outcome of this work (Drs. Miller and Koch) have finally given complete and exact steps in caries of dentin, as claimed by the leading advocates of micro-organic theories of decay. It will also be seen that the work of Dr. Miller was really the finding of the exact

method of the formation of the acid, which the older anonymous writer (1530), Robertson (1835), Regnard (1838), and others described as being formed by decomposition. (This paragraph statement is made by Dr. Black in his *Operative Dentistry*, Vol. 1, page 65.) He further says: "Occasionally we see almost the entire interior of the enamel cap, that is, almost the entire dentin of the tooth softened in this way, and yet the organic matrix is not broken up (enamel and dentin in the usual form)."

This character of decay with unbroken organic matrix will be known in this paper as The Neutral, or Neutral Salt Decay, as advocated by Keller in his Neutral Salt, Neutral Salt-Acid, and Neutral Salt-Alkaline Processes of Tooth Decomposition.

Black advocates same cause for both enamel and dentin decomposition. Vol. 1, page 68, second paragraph, in his *Operative Dentistry*, he says as follows:

*"Cause of Caries of Enamel and Dentin.*—Both caries of enamel and caries of dentin are caused by the same agencies, namely, the growth of micro-organisms in contact with the surface of the enamel, in the first instance, and the formation of lactic acid during that growth, which dissolves the calcium salts of which it, the enamel, is composed. In caries of dentin, the micro-organisms grow in the dentinal tubules and form their acid product within the tissue itself."

It will be noticed in the foregoing paragraph, that Dr. Black says, "form their (microbes) acid product," and paragraph 1, "during their growth." He does not say that the streptococcus (microbe) is a product of lactic or other acid fermentation (like the mother product and its germs in vinegar), but we are at liberty to infer from above quotations that the germs form, that is, develop within themselves and throw off or excrete the lactic acid, which decomposes the tooth.

According to foregoing quotations, it will be seen that the leading advocates of the microbic theory of decay, such as Drs. Miller, Black and Kirk, ascribe one sole cause of tooth decomposition to lactic acid decay, resulting from micro-organic fermentation in the mouth. It should be carefully observed that these gentlemen claim that all the various many-colored and physical and chemical characteristics in various processes are caused by one sole lactic acid agency. Yet they have never shown by classified research investigation that all of these different physical and chemical characteristics can be produced by one and the same acid agency.

During the year 1909 the writer after several years of classified research work in tooth decay, assigns caries to results from three distinct classes of chemical agencies. These three agencies produce the three distinct classes of decay found in the whole field of carious decomposition, with physical and chemical characteristics accordingly. These three agencies, however, are purely chemical in their effects on tooth structures. Furthermore, it must be remembered that these three processes of decay are not theories. He has shown by physical and chemical research work with the various acids, alkalies and neutral salts, which might destroy the teeth, that three distinct classes of decay result, corresponding to the different classes of rot in teeth.

According to this neutral salt process of decay, human saliva contains within itself chemical agencies of tooth decomposition. The writer formulated and prepared several of the leading neutral salt found in the saliva, by chemical process and in concentrated strength with these salts, produced a neutral decay in human teeth, that is, that particular decay which frequently has an unbroken organic matrix. In this decay a section of the tooth including both the enamel and dentin will have the lime salts largely extracted, have a dead-like semi-opaque or translucent color and appear to be intact. The point of an excavator, however, will penetrate readily, and frequently the whole body of the disintegrated mass can be removed in one piece.

Neutral salts of the saliva with excess acidity give the neutral salt-acid decay and with excess alkalinity the neutral salt-alkaline decay. Any acid which might obtain in the mouth, through microbic agency or otherwise, if in sufficient quantity and strength, would cause an excess acidity, and a neutral salt-acid decay would result accordingly. The same may be said of excess alkalinity. There will be occasion to repeat and to refer to these distinct classes of chemical decay subsequently in this paper.

There are but five forces in nature which might destroy human teeth. They are as follows: Friction, solution, absorption, exfoliation and decomposition.

Friction and various physical forces in nature might break down, destroy or pulverize tooth structure, but it would never cause the physical and chemical characteristics of tooth decay.

There is no known physical solvent of tooth structure. The human bones and teeth may lie for centuries in the atmosphere, in

water, or in any of the well known physical solvents without being broken up into either atomic or molecular subdivision.

The teeth are formulated with such low degree of vitality that they are not subject to the systemic absorptive and renewal processes. When the enamel, dentin or cementum of the teeth is once destroyed or lost by any of the forces of nature, such lost parts are never renewed again. The alveolar process surrounding the teeth may be lost either by absorption, exfoliation, decomposition or other forces of nature, but under certain favorable surroundings and systemic conditions, said process will be renewed, but there are no renewal agencies which replace tooth structure when lost by disease or otherwise.

Tooth structure is so firmly fixed in physics and chemistry, that no absorbent vessels surrounding them can imbibe their enamel, dentin or cementum. The function of absorbing vessels cannot obtain from without in sufficient force to break down their atomic or molecular structure to supply absorptive material. No internal absorptive force in tooth structure is sufficient to effect cellular disarrangement, thereby enabling absorption into the pulp through the dentinal tubules, thence into the general circulation. For these reasons carious decomposition cannot be attributed to the agency of absorption.

Exfoliation has no agency in producing dental caries, for the reason that before the exfoliating process can take place there must be a disintegration, a loosening up of the parts to be thrown off. To separate and come off in scales or pieces, or to split up in parts ready for exfoliation, does not apply to carious decomposition.

*Decomposition.*—Chemical decomposition, therefore, is the only agency in nature which can produce caries in teeth. The separating of the constituent parts of tooth structure, such as its atoms, molecules, cells, tubules, and enamel rods requires a chemical force, because enamel, dentin and cementum are atomic, molecular and cellular structures. Chemical force is required to release these parts from their previous combinations. Atoms or molecules in this separating process may enter into new combinations and form other chemical unions, hence the forces of decomposition must be somewhat analogous to the binding forces of chemical union. They must belong to the same class. There must also be different degrees of affinities, else there can be no dissolution and removal. The resolu-

tion of forces must be of such character as to set free from previously existing forms of chemical unity.

Chemical dissolution, one of the eleven leading causes of decay aforegiven, is accepted by the later writers beyond doubt to be the cause of caries. Chemical agency is now universally accepted. The problem of decay has been solved so far as to show that chemical agency only can produce what is commonly known as rot in human teeth. Chemico-parasitic causes means chemical dissolution, for the reason that it is an established scientific fact that micro-organisms have no direct agency in breaking down tooth structure. The effect and force which they may result comes from the chemical agency which they may develop. Hence, micro-organic decay would mean decay resulting from some chemical agency arising from the acids which micro-organisms may produce.

There are many advocates of the micro-organic lactic acid theories of decay. There are many others aside from the leading names aforementioned; but these advocates of these microbic theories have made no attempt to classify the chemical agencies of tooth decomposition, that is, the different chemical agencies which might break down tooth structure. The lime salts of the tooth are held together in chemical union by acid agency. Both alkali and acid are concerned in the chemical decomposition of teeth; hence, both acid and alkali in proper relation and in sufficient force and strength will chemically decompose tooth structures. Either acid or alkali or their combinations, certain kinds, will destroy.

For these reasons, it is error, as will be shown in this paper, to ascribe the cause of tooth decay to a single class of chemical agency; such as an acid agency, as advocated by Miller, Black, Kirk, Williams, Brown, Regnard, Magstot and others.

It is well known that certain minerals and vegetable acids will readily disintegrate the lime salts of tooth structure. It is not well known, however, that some of the alkalies and their compounds are about as destructive to human teeth as acids. Keller has shown by physical and chemical experiments that some alkalies will extract acid combinations from their lime salts, thereby loosening them up. Potassium hydrate and its compounds are quite as destructive as the ordinary acids. The advocates of the lone micro-organic acid agencies of decay, it seems have overlooked the fact that the alkaline agencies in the mouth are destructive to teeth. Miller in his great work,



"Micro-organisms of the Human Mouth," 230 pages in all, never observes or mentions that the alkalies might have even an assistant agency in decomposing the teeth. Black in his "Operative Dentistry," Vol. 1, devotes pages 60 to 153, ninety-three pages in all, to discussing the various stages and conditions and causes of rot in human teeth, absolutely fails to observe or note that the alkaline agencies in the saliva might either cause or assist in carious decomposition. He positively and decidedly gives but one cause for the malady in question, and that cause is lactic acid disintegration, as will be seen from foregoing quotations. Kirk, the able editor of the Dental Cosmos, also fails to attribute caries causes to an alkaline agency, or to be assisted by same. In his paper in July, 1910, Cosmos, pages 729 to 737, he frequently mentions the presence of alkalies as a constituent of human saliva, but does not ascribe same to be causative or even assistant causative. In said paper, page 734, column 1, he may be quoted as follows:

"My own observation of many cases, as they are examined at our college clinic, leads me to the conclusion that the most active expression of caries is to be found in mouths having an alkaline and highly mucoid saliva, and that such saliva is characteristic of the starch and sugar eater."

The above quotation shows conclusively that Dr. Kirk observes and knows that the human saliva contains alkaline agencies. We may infer the same as to Miller, Black and others. They certainly should all have observed that some of the alkaline substances are destructive to tooth bone. The fact that the alkaline agencies are always in the saliva and lactic acid is not, indicates that the alkalies and their compounds are more destructive to tooth structure than any lone acid agency. The writer is utterly unable to comprehend why so many scholarly and able men, who have been studying caries causes for thirty to forty years, have not considered alkaline substances among the agencies of rot in human teeth.

Subsequently this paper will give the atomic, molecular, cellular, tubular and rodular constitution of human teeth. The atomic and molecular constitution, especially anyone with a reasoning understanding of the same in way of cause and effect, will be able to comprehend the reason why the potassium alkaline salts have such a high chemical affinity for tooth structure.

Recently the writer has had some correspondence with Kirk, Black and others in reference to Kirk's paper in July, 1910, *Cosmos*, and in discussion of the problem of tooth decay in general. He has had occasion to call their special attention to the alkaline agency in caries and to the sole lactic acid theory of rot. If by chemical experimentation certain alkaline agencies are found to be destructive to tooth structure, and said agencies are found in the human saliva, it may be said with good reason and sound logic that such agencies will at least assist in the work of tooth disintegration.

So far the advocates of the micro-organic lactic acid theories of decay have never attempted to show that lactic acid develops or obtains in the mouth in sufficient strength and time to cause caries, nor that said agencies of decay will produce the three different classes of the malady in question.

(To be Continued.)

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### TOOTH POWDERS.

BY GEORGE B. HARRIS, B. SC., D. D. S., DETROIT.

The tooth powders and pastes of the following companies were used in experiments conducted by me during the past year:

Euthymol paste.

Euthymol powder, Parke, Davis Co., Detroit.

Colgate's powder.

Colgate's paste, Colgate & Co., New York City.

Dr. Grave's powder, Chicago.

Sanitol powder.

Sanitol paste, Sanitol Co., St. Louis.

Piso's powder, Warren, Pa.

Orothylol paste.

Orothylol powder, A. C. Clark & Co., Chicago.

Listerine powder, Lambert Pharmacy Co., St. Louis.

Calox powder, McKesson & Robbins, New York City.

Sozodont powder, Hall & Ruckel, New York City.

Zodenta paste, F. F. Ingram Co., Detroit.

Dentacura paste, Newark, N. J.

I might say that the samples used in these experiments were purchased through the ordinary channels of trade.

The basis of practically all tooth powders and pastes is Precipitated Calicum Carbonade ( $\text{Ca}^2 \text{Co}_3$ —prepared chalk). Other in-

gredients as magnesium carbonate, potassium chlorate, sodium carbonate, are used in conjunction with the calcium carbonate. Flavoring agents as oils of peppermint, wintergreen, cinnamon, cloves, and also substances as thymol, and other antiseptics are used. Oils of cassia and myrrh are to be found in many of them. Astringent, alkaline and antiseptic agents producing a variety as great as the colors of Jacob's coat are used in various forms and quantities. Some of these are useful and others not only are not useful but harmful. Take, for instance, a strong alkaline powder or mouth wash that is to be used as a daily tooth or mouth cleaner. The effect it will have on the tissues of the mouth cannot be otherwise than harmful, as it keeps the capillaries continually contracted, thus interfering, to a marked degree, on the circulation and hence the proper nutrition of the gums and pulp itself. This class of powders may be useful in acute and chronic cases of hyperemia and inflammatory conditions but, as these conditions are produced by, and by which, nature overcomes infectious, and removes, by absorption, foreign material, I question the use of strong astringents in these cases. Certainly the free and daily use of such products will produce the most damaging results. Also in the treatment of inflammatory conditions and in the treatment of spongy gums, pyorrhoea and its allied conditions, the use of strong astringents, while they may bring temporary relief, do not and cannot produce a permanent cure or assist in so doing. A stimulant, best produced by artificial means, such as is produced by rubbing the finger over the gums, will give much more satisfactory results. By so doing we will assist nature to increase the circulation and not inhibit it as astringents do.

A tooth powder, paste or mouth wash, should be slightly alkaline. The normal condition of the mouth has been shown to be neutral and too strong an alkaline agent will not only neutralize the acidity in the mouth, but will leave the mouth in a strong alkaline condition, which is almost as harmful as an acid condition.

The antiseptic qualities of a tooth powder deserve only passing notice. To use a powder having strong antiseptic properties will almost invariably do more harm than good. There is no known antiseptic agent capable of destroying bacteria that will not in turn destroy the cells of the body as quickly and as easily.

There are many agents that will inhibit the growth of bacteria by producing an unfavorable condition for the growth, but agents of this

class lose their power very quickly and while, in a concentrated form, they possess marked antiseptic properties, in the dilute form in which they must be used, their antiseptic properties are very fleeting indeed.

When we consider that the vast majority of people, who clean their teeth or attempt to, do so only once a day and that in the morning, what effect would the strongest antiseptics known have on bacteria during the night? And how much of the antiseptic qualities will remain after we drink a glass of water? We must depend upon the complete removal of all fermentable material from the teeth and not upon antiseptics. Remove the food of the bacteria and no antiseptics or alkaline agencies will be needed.

The only way this can be done is by means of the tooth brush. Dr. Miller has clearly shown what damaging results the improper use of the tooth brush has upon the teeth. He clearly shows that the vast majority of cases of erosion are caused from the wearing away of the enamel by too coarse a dentifrice and too strenuous use of the brush. To prevent this the finest tooth powder possible to produce should be used.

This leads me to another consideration. That of prescribing a tooth powder for the daily use of patients. Few druggists would take the time to put up the finest powder possible, and still fewer would have the facilities if they were so inclined.

In the examination of the tooth powders and pastes named above I found no traces of sugar or other fermentable substance. I found that the alkalinity varied from slightly alkaline to a strong. The solubility varied from slightly soluble to almost insoluble. Two drops of lactic acid caused a complete solution in the case of one powder and almost complete solution in two others. The rest only partly dissolved. The more soluble powders showed a greater power toward the neutralization of the acid than those that were only slightly soluble.

The so-called oxygen producing powders contain no more antiseptic ability, other conditions being equal, than do those that do not produce oxygen in a free state. Oxygen has no antiseptic properties except in cases of anarobic germs, and anarobic germs cannot live in the mouth. For this reason a tooth powder depending upon the liberation of oxygen for its antiseptic properties and this alone, in reality it has no antiseptic power whatever.

## A BAD TOOTH.

It was toothache ailed poor Murphy, and his jaw hummed night and  
day

Like a beehive in the orchard depths in honey-making May.  
He tried everything to stop it, that he'd heard or read about,  
But he didn't try the dentist—for he was "sceered" to have it out.

There it stayed, that hateful, twisting, grinding torture in the jaw,  
Like a grinding little demon with the nerve clutched in his paw.  
Murphy couldn't keep from cussing; he would groan and curse and  
shout,  
'Till the neighbors thought him crazy—but he was sceered to have it  
out.

Jaw and cheek and tongue were peeling from the stuff that he'd  
applied,  
And he couldn't sleep the imp off, for it woke him when he tried.  
He was sore and weak and wasted, and his tooth jumped like a trout;  
But he clenched his fists and bore it—for he was sceered to have it out.

So he languished, wrenched and anguished, for a fortnight, black with  
pain,  
Then he rushed to find a dentist—and turned weakly back again.  
Awful visions rose before him, filled his trembling soul with doubt,  
And he slunk back to his torment—for he was sceered to have it out.

Deeper, blacker, grew the anguish that was eating up his soul  
'Till his very life seemed ebbing through that little, angry hole.  
And the imp kept twisting, twisting, with the bitter spite of gout,  
'Till poor Murphy writhed and whimpered—but he wouldn't have it  
out.

"I will live it down," he muttered; and he went his feeble way,  
Till the pain grew like a stormcloud blotting out the light of day.  
On the last verge of endurance, with just strength enough to crawl,  
He went cowering to the dentist—and 'twas fun to have it out!

—O. G. C.

## PROSTHETIC PROCEDURES FOR FUTURE DENTAL STUDENTS.

BY J. C. CHRISTOPHER, D. D. S.

This department of dentistry has been greatly enlarged in the last ten years, but there are still a great many things to be done which will improve the standard of this important branch of dentistry.

I have often heard the dental student remark, "Oh, I'm not going to spend my time in the laboratory when I get through with the required amount of work. I can send my work to the dental laboratory." This statement is made with little thought of what the future will bring forth, as it is just as important, if not more so, to exercise every care and precaution in preparing the models for a laboratory as it would be if the student were to do the work himself. An occasion may arise when it is necessary to solicit the aid of the mechanic, and it would not be justice to the assistant; as the laboratory is called to do perfect work both in fit and finish, if the preliminary or preparatory work is not done with care and precision. I have come in contact with this class of student after he has become a full-fledged dentist; I have watched his weakness and failings in the simplest technics, his utter lack of judgment to the construction of the work at hand, with the result that the patient will receive an inferior grade of work which reflects not only on the operator, but is a reflection upon the dental school from which he graduated. It can be said that this deficiency is not the fault of improper teaching, but rather lack of interest on the part of the student, who does not at the time realize the great importance of dental prosthesis.

The question arises: what can we do to improve the standard of the coming practitioner in this branch of dentistry, considering the present length of the college course? From my personal observations of the numerous cases that come under my care I would suggest a special course of model preparation which would show the exact conditions of the case, as articulated models show the true conditions from which you can form a better idea as to the proper method of procedure. In addition to this it will make the student

more proficient in taking proper impressions and correct edentulous antagonisms, which are the foundation for all properly constructed mechanical appliances. More failures are due to the carelessness of preparatory work than to faulty construction, whether it is being done by the operator or is sent out to the laboratory for construction. The tendency is to get away from the strict technics, as taught at the college, and drift into slipshod methods that may shorten the operation, but most often spoil the results. The practitioner who shows good mechanical skill is also found to be the best operator, because he does not allow himself to be deceived by false notions about speedy methods, but prefers to work with forethought on firm principles that will produce permanent instead of temporary work. A valuable addition to the prosthetic requirement for the student would be the preparation of a half dozen mounted models that have been prepared from plaster impressions of rubber dentures; the same number showing how teeth have been prepared preliminary to the construction of crowns or bridge work. In these cases the plaster teeth can be cut down on the cast to proper size. A selection of models showing different articulations which indicate the use of special methods which must be employed to restore the missing parts to their normal usefulness, would also offer an opportunity for the student to display his judgment in deciding what to do; and this would also bring his reserve knowledge to the technic required as to how it should be done. It does not make a particle of difference whether he will personally produce the work or have others perform the mechanical construction for him. The operator must be the architect, draw the plans, and let out the contracts, and see that the specifications are carried out. The saying of the Irishman fully illustrates this point; when asked shortly after arriving in this country if he had obtained employment, he answered: "Shure, oim working for a building contractor, and an 'asy job it is. I carry bricks and mortor for the mon on top of the building and he does all the work." Let this be a stimulant for the student as well as the practitioner to the master of this work; learn to judge conditions accurately and carry out the work to a successful ending. The lack of care shown in preliminary steps shows a deficiency of early training during his student days.

Many practitioners have a dislike for taking plaster impres-

sions when it is a known fact that no other substance can properly take the place of it. Some give the excuse that the patient objects to it, others again say it soils the office with bits of plaster, and to the majority it is an operation which is to be gotten through with as quickly as possible without any thought about the selection of proper size tray or plaster mixed to the proper consistency. If the first impression is a failure, you hesitate about taking another for fear of displeasing your patient. Right here is the beginning of failures; but stop and consider—is it advisable to accept good enough when you are taking chances on having to make the work all over again, and subjecting the patient to the far greater annoyance and disappointment of going through the same process again? It is much safer and easier to impress upon your patient the necessity for a good impression, when it is for the good of the work, than it is to make excuses for failures, even if you must take two or three impressions before you get one that is correct.

In this connection it may be of interest to give a suggestion for making a simple, but nevertheless effective separating material for plaster impressions, which is made of the following ingredients: Dissolve half a bar of ivory soap in a pint of warm water; to this add two ounces of red ink; place the bottle in a pan of water, allowing this to boil until the solution is perfectly blended. It is then ready for use. Soak the impressions first in cold water for a few minutes; next apply your separating solution with a brush; apply freely and rinse off the excess. Your impression is now ready for pouring. You will find it an easy matter to separate the impression from your model, and the results will be a clear model that has not been changed by the addition of the separating medium.

This will no doubt be encouraging for many who have experienced some difficulty in separating plaster impressions from the model, especially in partial cases, to use plaster more frequently for impressions instead of relying on compound or wax. This latter material has its uses and is used with success in some cases, but it is more often abused simply because it may be more agreeable to the patient and the operator. But experience has taught us that it is not always the easiest method which is the best; the hardest methods are made easy by practice, and practice makes perfect.



**DENTISTS ARE AT FAULT.**

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BY BERNARD J. CIGRAND, M. S., D. D. S.

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While pyorrhea alveolaris is classed as a disease, gomphiasis must be termed a physical condition sometimes noted in middle aged persons. Gomphiasis presents the same relation to the physical economy that gray hair does—being indicative of age—but not necessarily so. In gomphiasis the teeth are loose and they seldom present decay, and are of a cream yellow shade. There are no signs of alveolar absorption or presence of waste product or pus. The teeth are generally long and possess ill-shaped cusps; never bell shaped, but rather of cubic outlines. My attention was directed to this abnormality something like twelve years ago.

Gomphiasis is so akin in its manifestations to pyorrhea alveolaris that many practitioners make the mistake in treating it with medicines and instruments adapted to pyorrhea, and meeting with ill results are apt to pronounce it a stubborn case of gingivitis, and invariably recommend the extraction of all the teeth, substituting artificial ones, when it remained within the dental province to restore and save the natural dental organs. The extraction of teeth in such a case is entirely contra-indicated, in as much as appliances will give stability to the affected parts, and they will speedily yield and become normal in character.

The abuse that some dentists accord in case of this defect is astonishing. A healthy tooth submitted to such digging would induce a severe and distressing inflammation.

I have observed that cases of gomphiasis are mostly found in people of the lymphatic temperament and cannot be termed an abnormal condition, inasmuch as the osseous structure of their being is of a less dense or firm nature. The gums are naturally flabby and the entire system is rather of a lower form. We may readily recognize this temperament by the following general and special characteristics:

*The Lymphatic Temperament*—To the ancients known as the phlegmatic. This temperament might be called stomachic or digestive. External indications, round and well-developed jaws. Constitutional outlines, fleshy and bulky, general movements slow and

sluggish. Hair, coarse, straight and drab. Fingers, short, flabby and cold. The jaws have a decided lateral movement. The cusps flat and muscles indistinct.

The primal requisite in treating a true case of gomphiasis rests in rendering stability to the troubling teeth, and in granting exercise to jaw.

The subject of mastication is one in which we as dentists ought to be profoundly interested, not alone in the genus homo, but in the entire animal kingdom, since a full understanding of the process of eating and philosophy of mastication can come only after a diligent study of comparative anatomy. Now, I believe that all animals having teeth eat, yet not all animals having teeth masticate. To me the word mastication means the process of cutting and crushing of food; and this word according to such inference relates most happily to man, since his jaws admit of the functions of cutting, grinding and crushing. Hence, the essential event sought is to establish a tightness of these teeth by natural means and hence afford nature the opportunity of restoring the wasted parts and rejuvenating the affected regions.

I have aided patrons most emphatically by advising the chewing of spruce gum or tar or unvulcanized dental rubber, and in some few instances have cured what was pronounced a distressing form of pyorrhea alveolaris. I hold to the opinion that too many teeth are treated as pyorrhea which simply require action of the jaw.

Our crowns and bridges would last longer if we instructed patients how to put force upon them. As it now is, practitioners dismiss the patient with the edict, "Do not bite hard on the attachment, as it will not endure under severe stress or strain." The result is the teeth or roots upon which the case is anchored are jealously guarded and no force of jaw exerted—the roots soon from disuse and protection become loose, and the bridge or crowns become a failure because of professional warning. Better instruct patients to bite naturally, using the normal force—even at the expense of repairing or construction of new appliances. The patient's appearance is secondary to its health. It may be æsthesia to place on a short bicuspid a porcelain crown, and it may be acceptable to caution patient against eating on that crown, but I hold it better dental service to adjust a well contoured and accurately filled gold shell and tell the

patrons: "Now, use that side of the mouth; eat natural and retain your health." Porcelain has its place; porcelain has its mission, but when I find that I cannot use bulk and get substantial results, I somehow still hold that the properly formed and careful adjusted gold crown has merits congenial to the laws of physiology.

The dental profession should not construct appliances which will hinder normal masticatory forces. The action of the jaw, its influence on the osseous and vascular tissues, together with its effect on the six major oral glands, and the innumerable minor ones secluded in the cheek and mouth should not be jeopardized to frail and pretty prosthetic substitutes.

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#### CORRECTION.

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The word "Odontological" in article "Does Miscegenation Cause Dental Irregularities," by S. L. Silverman, D. D. S., page 476, September number, should be "Odontolocial."

# EUROPEAN PROGRESS.

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CONDUCTED BY THOMAS L. LARSENEUR, D. D. S.

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## AN IMPROVED TREATMENT OF PYORRHEA ALVEOLARIS.

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BY C. R. WOODRUFF, M.R.C.S., L.R.C.P., L.D.S.

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(*The Dental Surgeon*, London, October 1, 1910.)

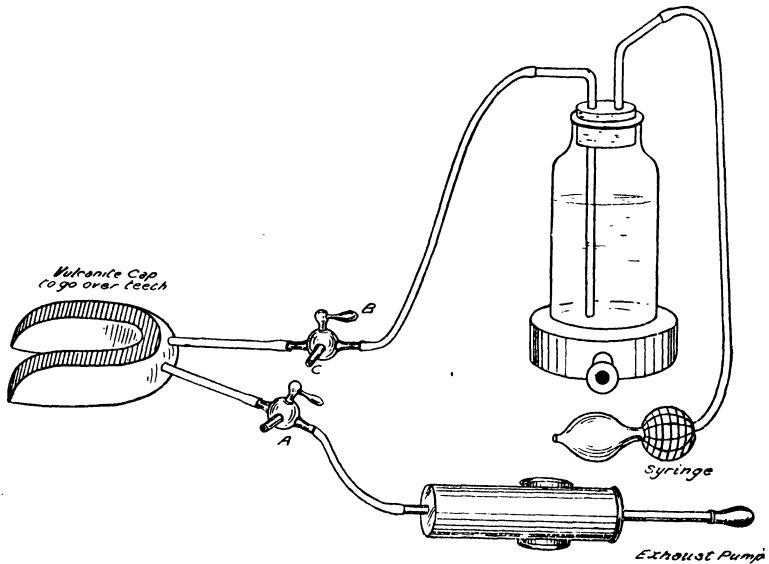
Pyorrhea alveolaris, as a disease, has in the past been much overlooked; it is now, however, coming to be recognized as the chief, though not necessarily the only causative factor in a number of pathological conditions of varying importance. For example, oral sepsis is now usually quoted as a cause of lassitude, headaches, and slight attacks of gastritis among minor illnesses and even of such graver conditions as pernicious anaemia, gastric ulcer, arthritis, and appendicitis.

Many patients suffering from pyorrhea do not complain of anything except the local condition, *i. e.*, bleeding and recession of the gums, discharge foul breath; but on questioning the patient more closely, a history that he is not so "fit" as formerly, tires easily, has a poor appetite, is losing weight and becoming slightly anaemic, can usually be elicited. - All these symptoms are most probably due to the constant swallowing of small quantities of pus, and if no treatment be instituted a much more serious condition will undoubtedly ensue.

In the early stages of the disease much can be done to delay its progress and counteract any toxic effects which may arise. In more advanced cases where the disease has spread to such an extent as to cause much absorption of the alveolus, and where marked toxic symptoms are present, extraction of the teeth is the only correct treatment. Again, in all cases where milder measures do not cure the toxæmic condition, extraction should be advised without hesitation.

For the slighter cases of pyorrhea alveolaris the following is a form of treatment which, though in its infancy, has given very satisfactory results up to the present time: Mr. J. F. Colyer, at the Royal Dental Hospital, has for some time been applying Bier's passive congestion treatment to these cases by means of an apparatus con-

sisting of two padded bars attached to a spring, which, when adjusted to the gums (one bar on the lingual side and the other one the labial), will impede the local circulation sufficiently to cause engorgement. This treatment, I believe, can be more efficiently carried out by means of the appliance described below, which will cause engorgement of the gums, empty the pockets of pus, and irrigate them with some anti-septic solution.



In the first place an accurate impression of the patient's mouth must be taken, and from this a vulcanite cap is made, which covers over the teeth and gums without being actually in contact with the teeth.

The cap only fits onto the gums at its free edge, which is covered with rubber in order that a tight fit may be obtained without damage to the mucous membrane. Two tubes are fitted to the cap, one in connection with an exhaust pump, the other with a bottle of disinfectant fluid, to which is attached a syringe, as illustrated in the accompanying diagram.

The bottle of fluid is first disconnected, and a three-way tap B turned so that no air can be drawn in or out. The cap is now put over the teeth and gums retained in position by the patient biting

on it. The tap at A is now turned so that the air can be exhausted by the pump; this exhaustion is stopped directly when it becomes at all painful. The tap is now turned to shut off the pump from the cap, which is left in position for five minutes. On removing the cap at the end of this time, the gums are seen to be well engorged, and all of the pus is round the necks of the teeth. The mouth is then rinsed out with a disinfectant, such as dioxygen.

The bottle of disinfectant is now connected, and the fluid squirted up the tube until it comes out at C; then turn tap so that it neither comes out at C nor runs on into the cap. The syringe is then again squeezed to put the fluid under slight pressure. Now place the cap in the mouth as before and exhaust the air with the exhaust pump, and then disconnect pump by means of tap A. Now turn B so that the fluid rushes up into the cap and irrigates the gums; turn B as it was before and leave for five minutes before removal.

The patient will now for some time have a mouth free from pus and a healthy reaction taking place in the gums and periodontal membrane.

Ideally this procedure should be carried out three times a day, but if done twice a day there should soon be marked improvement in the patient's general condition.

Before using the apparatus, the teeth should be freed from all tartar.

I hope at a later date to be able to publish the results of a trial of this treatment on a series of cases.—*St. Bartholomew's Hospital Journal*.

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### BISMUTH POISONING IN SURGICAL PRACTICE.

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(*The British Medical Journal*.)

Beck (*Zentralb. f. Chir.*, No. 17, 1910) directs attention to the fact that in the course of the last twelve months many instances have been recorded of serious and occasionally of fatal results from the use of bismuth paste in the local treatment of suppurating cavities and fistulæ.

Reich, of Tübingen, has collected sixteen cases, with seven deaths, and of three cases recently put on record by Matsuoka two were fatal.

The earliest symptom of the chronic form of poisoning caused

by the slow and prolonged absorption of bismuth by a suppurating surface is a pale livid tint of the skin. This is followed by an eruption of small, bluish ulcers on the gums. The further progress of the poisoning is marked by nausea, headache, vomiting, and albuminuria. In advanced cases the ulceration of the gums increases and the patient becomes emaciated, and gradually succumbs. The author, who in his own practice observed cases of the kind, states that the bad results of the slow absorption of bismuth may be prevented by constantly looking out for the appearance of the early signs of the poisoning, and if any of these be manifested, by injecting into the cavity still occupied by the bismuth paste some warm and sterilized olive oil, which is allowed to remain from twelve to twenty-four hours, and until it has formed an emulsion which can be removed by aspiration.

The use of bismuth paste is contraindicated in cases of acute suppuration, particularly empyema, as absorption so readily occurs at the fresh inner surface of the suppuration. On the other hand, in old abscesses cavities with thick and fibrous walls with much diminished capacity for absorption, the paste may be applied with but slight risk.

The maximum strength of the paste used by the author is 33 per cent. When the secretion becomes sterile, the paste containing this proportion of bismuth is withdrawn and replaced either by a 10 per cent paste or by sterilized vaseline.—*The Dental Surgeon*.

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#### A CASE OF ACUTE POISONING BY ANTIPYRIN.

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BY G. D. H. WALLACE, RESIDENT SURGEON, BIRMINGHAM GENERAL DISPENSARY.

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(*The Dental Surgeon*, London, August 13, 1910.)

A *healthy-looking* girl, aged 20, was brought to see me on April 2nd. She had been suffering from toothache, and on the advice of a friend had sent to a druggist for 10 gr. of antipyrin. Within fifteen minutes of taking it, she complained of a feeling of faintness and suffocation, and her face became "blotchy" and swollen. When I saw her she was perspiring freely, the skin of the face and neck was oedematous, and there was a profuse urticarial eruption on the face, neck, and upper part of the chest. The pulse was 120, very soft,

feeble, and irregular. The temperature was 95.5 F. Whilst being examined she suddenly collapsed, her face became very cyanosed, and she lost consciousness. Brandy by the mouth and strychnine hypodermically were administered, and in the course of a few minutes she regained consciousness. She was put to bed, hot water bottles applied, and a calomel powder given. Three hours later the temperature had risen to 97°, the pulse-rate was 90, and the oedema of the face and neck had markedly diminished.

She was kept on a milk diet for two days, by which time the temperature had risen to normal, and the swelling of the urticaria had completely disappeared. There was no diarrhea or vomiting throughout, and the case differed materially from cases of ptomaine poisoning. Its most marked features were the rapid onset and recovery, the low temperature, and the great prostration. The patient had never had a previous attack (she had never taken antipyrin before), and a careful inquiry failed to elicit a history of anything eaten which might have caused the symptoms.—*Lancet*.

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#### TREATMENT OF AN EPULIS WITH ARSENIOS ACID.

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BY DR. O. AMOEDO.

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The patient presented an epulis situated between the upper first and second left molars, measuring 2 cm. in breadth, 1½ cm. in height, and 8 cm. in diameter. It was pedunculated, the stalk starting from the interdental space.

Both molars had approximal cavities, the first presenting a live and exposed pulp, the second being affected with caries of the second degree. The gingivae of the whole mouth were inflamed, owing to the lack of care of the mouth. Excision of the tumor, extraction of the neighboring teeth, and extirpation of the interdental wall were contraindicated, the patient being pregnant and exceedingly nervous.

Dr. Amoedo therefore thought of utilizing the caustic property of arsenious acid, which he applied in the following manner: Between the tumor and the approximal walls, well up against the pedicle, a pellet of cotton was introduced saturated with phenol, and containing the same quantity of arsenious acid as is employed for the devitalization of a pulp.



This was covered with cotton saturated with aristol. The night following this application the patient experienced pain such as is usual on applying arsenious acid to a pulp. Three days later the tumor and its pedicle were atrophied, and could be removed with a pair of pliers.

The region was well washed, and the tissues saturated with a solution of dialyzed iron, in order to obtain an insoluble arsenite of iron, and thus prevent any further action of the arsenious acid on the bony tissues.

A week later, on examination with a sound, the interdental bone was found to be necrosed, the sequestrum to be expected to appear within from two to three months. The examination of the removed tumor proved it to be a small osteofibroma which justified the destruction of the bony wall in which the pedicle had been implanted.

When the patient was seen last the gingivae was quite sound and rosy at the former seat of the tumor, while the rest of the gingivae were red, and bled easily.

This method of procedure is not without grave danger and requires great prudence. Only a very small amount of arsenious acid can be applied, and as soon as this has produced the desired effect, an insoluble compound of arsenic must be produced by impregnating the tissues either with dialyzed iron, with hydrated magnesia as recommended by Dr. Capdepon, or still better, with silver nitrate or one of the organic compounds of silver, which penetrates the tissues more deeply, as indicated by Dr. Kirk.—*La Odontologia*.

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### THE TREATMENT OF TRIGEMINAL NEURALGIA BY INJECTIONS OF ALCOHOL.

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BY ALFRED W. CAMPBELL, M.D. (EDINBOROUGH), SYDNEY.

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(*The British Journal of Dental Science*, London, August 2, 1910.)

Trigeminal neuralgia, "tic douloureux," "epileptiform neuralgia," "Fothergill's disease," as it has been variously called, is one of the most painful of human affections, and until recent years has held its place as one of the most rebellious to treatment. Sufferers have told the tale that in the beginning the resources of pharmacopoeia were vainly exhausted; the extraction of many teeth followed;

next the application of electricity in various ways, vibratory massage and other means, all without benefit. On appeal to the surgeon there began a series of sections and resections, from periphery to centre, leading eventually to the operative limit, gasserectomy. Even then relief was not forthcoming, and in the end emaciated, edentulous and disfigured, unhinged mentally by privation, pain and despair, suicide appeared to be the sole refuge.

Faced by suffering so severe and intractable, it was gratifying to those who devote themselves to the treatment of nervous diseases to hear Schlosser's declaration, in the year 1903, at a medical congress in Heidelberg, that he had succeeded in effectively curing a long series of rebellious cases of trigeminal neuralgia by the injection of alcohol into the roots of the nerve. Peripheral injections of osmic acid and other chemicals had been previously tried, without satisfaction; the deep injection was novel. Schlosser's results were so striking, that others on the continent, including Ostwalt of Paris, to whom I owe my instruction, took up and further elaborated the method, and more recently its use has spread to Great Britain and America, with the result that Schlosser's testimony has been confirmed in every particular, and neuralgia is no longer held in such dread on account of its intractability. At the same time it must be conceded that excellent as is this means of treatment, there still remains a small percentage of cases which injection does not benefit, and which cannot be benefited by anything short of gasserectomy thoroughly performed. The point, however, which emerges for emphasis, is that in these injections we have a means of treating neuralgia which is sound in principle and simple in the hands of practiced workers, and which therefore, in justice to the patient, should be given a fair trial before the difficult, dangerous, and disfiguring major operation is decided upon.

I began to take a practical interest in these injections some four years ago, and though my experience is small—confined to a handful of cases, as compared with hundreds treated by others—I am accordingly diffident in offering this communication, I still do so, because I think I have acquired a fair working acquaintance with the technique, and because readers of this *Gazette*, disposed to use this method, may find it to their advantage to share my knowledge.

*Principle of the Method.*—The principle of the method is to devitalise the offending nerve, so destroying its conductivity for painful

impressions, and a further aim is to prevent regeneration and reopening of the pathological stream.

Experiments have shown that, if a strong solution of alcohol (absolute alcohol 80 parts, water 20 parts) be injected into the substance of a nerve, in a quantity varying in proportion to the size of the nerve, and in such a manner that the solution reaches all the constituent fibres, perfect and complete Wallerian degeneration will in due course result. This being so it follows that injection of a nerve in one position must be the effect equivalent to neurotomy; injection in two positions to neurectomy. And taking clinical experience of a case neuralgia as a criterion, we may say that this equivalence is proved.

But concerning regeneration, though it is possible by injection of alcohol to devitalise and cause degeneration in a nerve, it is doubtful whether that nerve can be permanently non-conductive to painful stimuli. We know that nerve fibres are endowed with a remarkable capacity for reunion of neurotomy and neurectomy, and some, even cases of gasserectomy, in which recurrence of neuralgia has indicated that a pathway for the conduction of pain has been reopened; and with such object lessons in our mind, we can scarcely venture to hope that the effects of injection will rise superior to those of the more drastic measures. Referring again, however, to clinical knowledge, we can definitely state that the period assignable to the process of regeneration is no shorter in the case of a nerve devitalized by injection than in a case of neurotomy; moreover, cases of neuralgia in numbers can be pointed to, in some of which a single injection and in others a succession of injections have afforded what appears to be a lasting cure. It is conceivable, even probable, that the excellent results, lasting in their benefit, obtained by injection are ascribable to the possibility in the case of the trigeminal nerve of applying the solution to the very point where its branches emerge from the skull, close even to the ganglionic cells from which the individual fibres take origin, and it is not unlikely that some of the fluid, by diffusion, may destroy, or in some measure devitalize these cells, so hindering or even preventing regeneration.

Next I would point out that while it is our aim in making these injections to introduce the fluid to the centre of the nerve bundle, this cannot always be accomplished. Our goal is hidden, buried sev-

eral centimetres below the surface, and it is certain that the injection is frequently deposited not within the investing sheath, but in the neighborhood of the nerve. It must not be assumed, however, that an injection which fails exactly to strike and be discharged within the nerve is valueless, because such would be contrary to experience. Probable relief from the neuralgia will not be so prompt or so lasting as in a perfectly made injection, but relief will generally be given and it may be ascribed to interference with the trophic functions and conductivity of the nerve, brought about by the obliterative action of the alcohol on the blood vessels which ramify in the nerve sheath on their way to supply the nerve tubules. In this connection it may be remembered that disease of the vasa nervorum is an assigned pathological factor in the production of neuralgia, therefore, by obliterating these vessels we remove the factor.

I referred above to a devitalizing effect on the cells of the gasserian ganglion by diffusion of the alcohol, and may add that a more ideal treatment for the relief of neuralgia than devitalization of the nerve by injection would be devitalization of the gasserian ganglion by the same means. Although, so far I am aware, such treatment has not been applied to the human being, it has been suggested by Brissaud and Sicard, and the following experiment which they record speaks for its probable efficacy. Taking a dog, they injected the ganglion, and on killing the animal four weeks later, found disintegration of the ganglion cells and complete secondary degeneration of the three branches of the trigeminal nerve, a result which must be accepted as very satisfactory. Brissaud and Sicard would summon surgical aid to inject the ganglion effectively in the human subject, and have suggested making a skin incision beneath the zygoma, cutting the superficial muscles and removing the coronoid process of the inferior maxilla, so clearing the way for the introduction of a needle through the foramen ovale.

From anatomical observations made, it seems to me that the ganglion could be penetrated through the same foramen without surgical intervention, and more thoroughly injected because of a better angle of penetration, by piercing the skin with a straight needle immediately behind the neck of the condyle of the lower jaw, about 2.5 centimetres below the glenoid articulation, and engaging directly with the ganglion by pushing the point forwards, upwards and inwards

for a distance of approximately 5 centimetres. Danger of cutting the facial nerve and the internal maxillary artery might be avoided by the use of a stiletted needle.

*Forms of Neuralgia Suitable and Unsuitable for Treatment.*—Most forms of neuralgia are suitable for treatment, thus the method is applicable alike to mild cases and to those serious, prolonged cases for which neurectomy, gasserectomy and other surgical measures might by others be deemed necessary. It has always been used to lessen the final suffering in cases of inoperable tumor of the brain infiltrating and irritating the gasserian ganglion. In short, it is applicable, with exceptions to be mentioned presently, to all cases of true neuralgia of the fifth nerve not having a removable cause. In regards to this *proviso*, we are familiar with the slight attacks of trigeminal neuralgia which arise in persons temporarily ill or out of condition; also with the more severe neuralgia associated with eye-strain, with plumbism, with syphilis, with synusitis, and with dental caries. With such cases we are not concerned; they are mostly temporary and to be relieved by attacking the cause of which they are the manifestation. Among cases unsuitable for treatment are those complicated with malaria, as I myself can attest; likewise diabetic subjects, not only because the pain may remain unsubdued, but because serious trophic changes may be induced in the tissues supplied by the treated nerve; also, one cannot expect to relieve the pain simulating neuralgia in cases of migraine, neurasthenia and hysteria; and, lastly, I would mention that cases of neuralgia previously subjected to surgical operations occasion misgivings, and yet in one of my most successful cases an inch or more of the inferior dental nerve had been removed some months before, and cases stand on record wherein a recurrence of neuralgia after gasserectomy, has been effectively subdued by injection. After surgical measures, however, fibrous tissue formation and cicatricial contraction are unavoidable; irritating the end of the nerve and the regenerated portion, they may be reasonably considered as causes to some extent, of the recurring pain, and they constitute conditions which interfere with further treatment. It would appear, moreover, that in some cases, apart from regeneration along the course of the excised nerve, anastomotic ingrowths from other nerves may occur and be responsible for the renewal of pain. These anastomoses may even lead in from the opposite side, hence bilateral injection may bring relief, and has done so in at any rate one case.

*Frequency of Affection of Different Divisions.*—The following percentages are computed from an analysis of 154 cases gathered from medical writings and personal observation.

Most commonly, in approximately 40 per cent. of cases, the second and third divisions are implicated together. Other combinations are not nearly so common, about 15 per cent, and an implication of all three divisions is rare. The first division is affected alone in about 18 per cent. of cases, and the second and third divisions are affected alone in about 12 per cent. of cases respectively. I may add that the right side suffers more frequently than the left and bilateral affection is rare; also that females appear to be more prone to the disease than the males (Kiliani's figures do not support this statement) and that it is unusual for the disease to appear prior to the fortieth year of life.

*Injection Fluids.*—The list of substances which have been injected by various operators into nerves or their neighborhood for the relief of pain in various parts of the body, includes osmic acid, sodium chloride, cocaine, antipyrin, aconitine, strychnine, silver nitrate, novocaine, stovaine, betaeucaine, chloroform, ether, oxygen, sterilized air, carbolic acid and alcohol, but for trigeminal neuralgia, alcohol, either alone or mixed with cocaine or stovaine, holds the field, although it may be supplanted in time by carbolic acid, which has recently been recommended.

Schlosser, who in 1907 reported treatment of 123 cases, and Brissaud and Sicard, who in 1908 reported treatment of 63 cases, used an injection composed of absolute alcohol 80 parts and distilled water 20 parts, no anesthetic or other drug being added. Ostwalt, who in 1906 reported treatment of 152 cases, used alcohol of the strength just mentioned with  $1/6$  of a grain of stovaine or cocaine added to each drachm. In my work I have used both these solutions, but have not found that the cocainized alcohol has any advantage over the plain alcohol; both cause severe pain at the moment of the injection, which is the only time when an anesthetic effect is required, no severe pain being felt subsequently, hence since cocaine does not reduce this momentary suffering I have abandoned its use. Here let me say to those who think of adding chloroform to the alcohol, that it has been tried and not approved because it is believed to induce sclerosis of the surrounding tissues.

Carbolic acid has only recently been recommended by Ostwalt,

and I have not been able to give it a trial; nevertheless, I think it may be bracketed with alcohol, because Ostwalt's recommendation is so strong and his experience of the treatment of neuralgia by injection so extensive. We are told that the acid, which is diluted with glycerin, may be administered alone or in combination with alcohol, and its most important advantages from our point of view are that its injection is said to be painless, and the period of relief from the neuralgia from twice to five times as long as when alcohol is used. Further by varying the dilution with glycerin between 7 and 50 per cent. an exact dosage is obtainable for punctures in different situations. Yet another advantage outside the scope of this paper is that in dilution it may be applied to a motor or mixed nerve, and will quieten pain without inducing paralysis, as does alcohol.

(*To be Continued.*)

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#### TREATMENT OF MERCURIAL STOMATITIS.

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(*Les Annales Dentaires*, Paris, August, 1910.)

Mercurial stomatitis is one of the most disagreeable affections of syphilis to treat, and it requires a very difficult medication.

The choice of antiseptics is somewhat restricted, as they cannot be used in strong solution for fear of their caustic action upon the tissues of the mouth.

Dr. Siebert has made a special study on the different pastes for this treatment, the result of which is:

The paste should have a powerful antiseptic action, in order to reduce the number of treatments.

The paste should also have a durable action.

Dr. Siebert has a special preference for isoform paste. To prove the value of this paste and its powerful action, he adds 27 c.c. of test solution, 3 c.c. of saliva. He places this solution in a vapor bath, and every five minutes he adds a box of *Pietri*. He has in the same manner made the test with 5% aluminum acetate, 5% hydrogen dioxid, 1.5% permanganate of potassium, 4% boric acid, 2% odol, 2% calcium chloride, Beiersdorf paste and 5% isoform. These researches and experiments left him with three substances at his disposal: the permanganate, Beiersdorf paste and isoform. Unfor-

tunately, the action of the permanganate, which is very favorable, is only momentary.

In order to obtain the lasting period of these antiseptics, the writer makes a culture of the fluids of the mouth before the cleaning, then the patients wash out their mouths, some with water and others with the solutions upon which the experiment is conducted.

We cannot give here the long table of experiments made by Dr. Siebert; we will limit ourselves in giving the results.

Cultures from patients who had used plain water gave the following figures: after ten minutes, 50%; after four hours, 77% colonies of bacteria.

Those having used the Beiersdorf paste, after ten minutes, 35%; after four hours, 63%.

The patients who had used isoform to brush their teeth, after ten minutes, 8%, and after four hours, 9%.

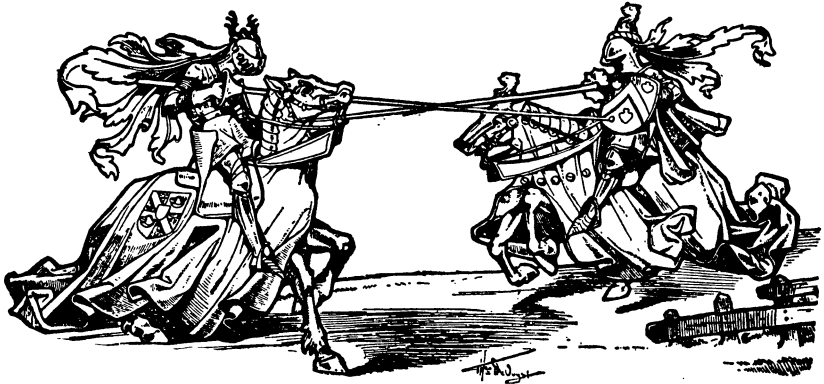
The bacterial colonies from the fluid of the mouth were counted by unity of surface.

These figures plainly demonstrate the superiority of isoform paste which has been used for this treatment.

Isoform has no toxic effect upon the tissues, and gives free oxygen when it is brought into contact with ulcerations and organic fluids.



# PROFESSIONAL ARENA.



[In the space devoted to this department many of the so-called solved problems are to be opened for re-examination. Besides such other topics as are of greatest importance will be brought to the attention of the readers, and ablest talent will be engaged to discuss interesting dental themes.]

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## AN OPTIMISTIC VIEW OF DENTISTRY.

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From The Texas Dental Journal, October, 1910.

The dentist of the lean and hungry Cassius type inheriting from his progenitors it may be a tendency towards gastric neurosis, and because of neglect or abuse of his physical self in leading a sedentary life, thus developing this tendency, acquiring enteritis and other kindred ailments as a natural sequence—could hardly be other than pessimistic in his estimate of his profession as a means of livelihood. He thinks the practice of dentistry a hard, nerve-racking life, and unremunerative, and would hardly advise a son or friend to adopt it as his life-work. But this view of dentistry is also shared by the robust; in fact, the complaint seems to be so very general that it is depressing. So that it is with much pleasure we have read from the pen of Dr. J. P. Root, editor of the *Western Dental Journal*, an article pitched in altogether a different chord. The article is so full of good common sense and truth that we hope every member of the profession may read it, ponder over it and be less discontented with his lot. We quote in part as follows:

“In dental literature of today there is considerable ink used in

explaining why most dentists are poor, and so few rich, the subject is of much interest to the rich ones, and to us poor ones, the reasons given are so varied it is difficult to select the real ones, which are: some of us fail to make enough, others spend too much, exactly the same reasons existing in any business or profession.

"Some writers of good advice claim we are poor because we do not charge enough. They present the deadly parallel columns, showing a carefully figured mathematical problem in percentage, giving a yearly income and expense account, in some cases basing the expense of the cost of being raised from childhood, and how much interest one should earn each year to credit to this account. They have it figured out to fractions how to eliminate all this financial worry and every one of us become rich, and in most cases it is by the simple process of charging more, not spending less.

*"I doubt if there is a class of men, of equal ability and attainments, who are better remunerated for their services than dentists, especially so when you consider the preliminary training most of them have, and the financial cost of same. The average student entering a dental college has not more than a high school education, which is not expensive. Their three years in college is not much of a luxury, except to those who work their way through, and then it is hardly a luxury, and as a rule in a year or two after graduation they have an income at least double that they would have, had they been drawing a salary in some other vocation, and the increase of income as years go by is far more than that of nine out of ten salaried men. Cities are full of capable salaried men, whose early training and environments were at least equal that of ours—whose incomes are not one-half that of the average dentist, besides their working hours are longer—they are subject to rules and regulations; in fact, in most cases they are slaves compared to us.*

"I doubt if there is a vocation where the average man has a better income than in dentistry. They are not all the same, any more than in medicine, law or in commercial pursuits, simply because we are not all equal. He who has a clientele of millionaires naturally has an income superior to he who takes care of butchers, bakers or candlestick makers, whose incomes do not justify high prices, yet some one must do for them.

"The same rule applies to all vocations, the merchant with the

corner store in a residence district does not enjoy the income of he who has a department store in the business section, yet he may enjoy it more—for the size of one's income does not regulate the enjoyment of life; also we, unlike the merchant, are not subject to the sheriff's sale—for over ninety per cent of all merchants fail. Go into a department store and see how many of the heads of departments are formerly prosperous merchants, compare your fate with theirs; are you compelled to be at business at 8 a. m.? Do you push a button registering your coming? Do you repeat this on going and coming to and from lunch, and again at 6 p. m. when the store closes? If you are out of sorts, do you have to go to work, or lose your job? If you want to go fishing on Saturday, don't you go? If you want a vacation in June or December, don't you take it, at the time you desire? Does the salaried man do these things, and would he not enjoy these privileges as much as you?

"We, like the physician, policeman, preacher, merchant and everybody else probably spend not too much, but more than we can afford, for it is a duty we owe ourselves, our family and the world to live within our income, to keep our debts paid, to provide for old age, and be satisfied with our position in life; if dissatisfaction prevails, look around at the other fellows, not at the few who live on the hill, but at the multitude who dwell in the hollows, then thank the Lord that you are better off than most of mankind."

# JOURNALISTIC GEMS.

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## TREATMENT OF THE DENTAL PULP.

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BY A. E. WEBSTER, L.D.S., D.D.S., M.D., TORONTO.

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The normal human tooth contains a vital pulp. The function of the pulp, according to a few histologists, has ceased when the tooth is fully developed. Upon this hypothesis many practitioners do not hesitate to devitalize the pulp of a tooth for reasons others would consider unjustifiable. The experience of the great majority of practitioners is that a pulp should not be devitalized, unless there is no hope of retaining it permanently in a normal vital condition. It may be justifiable to sometimes attempt to retain the vitality of a pulp even for a few years if the tooth is not fully developed.

Notwithstanding the argument set forth by histologists and some radical practitioners, observation shows that both the enamel and the dentine of a tooth which has lost its pulp have not the strength and endurance of a tooth which has a vital pulp. The earlier in life a tooth loses its pulp, the fewer years will it last. A tooth which loses its pulp before the normal closure of the apex or shortly after its eruption does not usually give many years of useful service. Both the tooth structure and the pericemental membrane lose in strength and in endurance. Teeth which have lost their pulps are not so useful for mastication as those with vital pulps. Dr. Black has shown that molars upon which a patient could bring to bear in closure a pressure of over two hundred pounds were reduced to a pressure of less than a hundred pounds by devitalization of the pulp. The pericemental membrane will not tolerate the same pressure after the pulp has been removed from the tooth as it did before. Thus, crowns supported by roots of teeth which have lost their pulps, and bridges supported by abutments without pulps are not as useful as if the pulps of the supporting roots and abutments had remained alive. While all teeth do not equally discolor when their pulps are devitalized, yet a sufficiently large number discolor badly enough to make the careful operator consider the possibilities of a darkened tooth. The degree of discoloration depends largely upon the mode of operating, but perhaps

almost as much upon the structure of the tooth. The younger the patient, the greater the possibilities for discoloration. No conscientious operator lightly undertakes the devitalization of the pulp of an anterior tooth for a young patient.

It is well recognized today that those cases of devitalization which give the best results are among single rooted teeth of mature persons; those from which the pulps can be most certainly removed. No preservative yet discovered will keep dead tissue in a pulp canal from infection. As the difficulties of removing all the pulp tissue from root canals increases, so do the chances for ultimate failure.

Few operators would hesitate to devitalize the pulp of a cuspid because they might not remove all the pulp, and thus cause the loss of the tooth. On the other hand, there are few operators who know anything about Dental Anatomy who would not hesitate to devitalize a third molar or sometimes an upper first bicuspid because of the difficulties of removing all the pulp and the subsequent possibilities of losing the tooth.

The foregoing reasons and those of the pain, discomfort, loss of time and the expense are enough to dissuade the dentist from needlessly devitalizing a dental pulp.

Strong as the reasons are for retaining a pulp alive where it is indicated, yet they are not as strong as those for devitalization, where such an operation is demanded. The pain, discomfort, the possibility of an alveolar abscess and its consequences are sufficient to cause the dentist to use all the knowledge and experience obtainable before deciding what is the wisest thing to do. In no case is the dentist's misjudgment fraught with such bad consequences as in not devitalizing a pulp which should be devitalized.

MANAGEMENT OF PULPS ALMOST EXPOSED OR EXPOSED WHEN THE  
OPERATOR BELIEVES CONSERVATION IS DESIRABLE.

DENTAL CARIES. It can be laid down as safe practice to protect or cap a pulp which has not caused pain that has lasted some hours and is not exposed when all the carious dentine is removed. It is always necessary to make a careful examination of the dentine covering the pulp in deep cavities to be sure that an exposure does not exist. This should be done with a magnifying lens, where it is possible. A fine pointed explorer or broach may be carefully passed over the area where the pulp would seem to be nearest. Care should be

taken not to allow the fine point to penetrate, else there would be unnecessary pain. Pressure should not be directed towards the pulp, the point should be drawn crownwards, rather than rootwards. The most likely point of exposure is at one of the horns of the pulp. In teeth which are angular in form with long cusps, the horns of the pulp run almost to the enamel.

**RECEDED PULPS.** There are many factors which may influence the location of the pulp. Any irritation which is not sufficient to destroy living tissue is a stimulant. All the slight irritations which occur to the pulps of teeth tends to make them throw out secondary dentine to protect themselves. The chief irritant or stimulant to the dental pulp is change of temperature. The pulps of old people are sometimes receded to the level of the neck of the tooth, while in all cases recession goes on as years advance. Teeth which are worn away will have their pulps receded; in fact, the horns of the pulp are usually obliterated in such teeth. The pulps of teeth of "mouth breathers" are usually more receded than others. Large metal fillings cause pulps to recede. Cavities which have not developed rapidly enough to cause an exposure or too much irritation cause recession. Erosions and pyorrhea alveolaris cause a similar result. Salt, acids and sugars are irritants when applied to the dentine of a tooth and cause recession. Having in mind these influences on the size and location of the pulp and an exact knowledge of the thickness of the tissues of the normal tooth there should rarely be any doubt as to the location of the horn of a pulp.

#### TEMPORARY TREATMENT OF EXPOSURES FROM DECAY.

If in the case of the young, the weak or very old, the removal of all the carious dentine would expose a pulp which had not previously pained and for good reasons a temporary operation is desirable, all of the decayed tissue—which means the soft or discolored tissue—may not be removed. It is desirable that large spoon-shaped excavators shall be used to remove decay from cavities in which there is any likelihood of exposing the pulps. Decalcified dentine is best removed by peeling it off in layers. The instrument may be cut into it close to the enamel, thus avoiding pressure upon the pulp and a pulling force applied to the instrument rather than a cutting one. With a little care and observation the decalcified dentine may be removed from deep cavities without pain. With all the decalcified dentine removed that is possible without an exposure, there are two courses of practice open

to the operator. In any case it is necessary to sterilize the remaining tissue. This cannot be done immediately. He may apply a disinfectant and seal the cavity for a few days, or he may apply a disinfectant with some solid substance and insert the filling at once. The most satisfactory practice is to disinfect the cavity, and at a subsequent sitting put in the filling. But since most of the operations under consideration are looked upon as temporary, the method of mixing the disinfectant with a non-irritating solid is the most satisfactory. It must be borne in mind that the main hope in these cases is for the pulp to die painlessly and not afterwards become infected with pyogenic organisms, or that it may remain in a quiescent condition until a more convenient season. It is believed by Black and others that if the remains remaining in the sterilized tissue are not sufficiently irritating to destroy the pulp, the disinfectant is. The disinfectant used in such cases must be as non-irritating and as permanent as possible.

**SHALLOW CAVITIES.** Shallow or saucer-shaped cavities, or those in small teeth, are best managed by disinfecting and filling at a subsequent sitting, because there is not room for a layer of a disinfecting material and the filling. A layer of oxy-phosphate of zinc or oxy-sulphate of zinc should be used as a protection in any case. Some operators cover that part of the cavity next to the pulp with varnish, such as benzo balsam, sandarac, copal or chlora percha and then apply the filling. This method is only advisable after disinfecting for several hours. If the cavity is deep and the immediate operation is decided upon, there is no method which gives better results than mixing oil of cloves with oxide of zinc or with oxy-sulphate of zinc and apply this to the pulpal wall with a round ended instrument, covering with oxy-phosphate of zinc.

#### TEETH NOT FULLY DEVELOPED.

Frequently deep cavities occur before the apex of the tooth is normally closed. In such cases it is very desirable to keep the pulp alive until calcification is completed. If the pulp is removed from an incompletely developed tooth the canal is larger at the apex than it is at any point nearer the crown, and as a consequence cannot be perfectly filled with a solid substance. Besides this, it is difficult to devitalize and remove the pulp and dry the canal at the end. The chances for permanency are very remote. Every possible effort should

be made to keep the pulps of the young alive. A careful study of the following table will be helpful in deciding the proper procedure.

#### TEMPORARY TEETH.

Twenty in number.

Calcification Begins, Centrals 4th F.M. Complete 17th to 18th M. Eruption, 6th to 7th M. Begins, Lateral 4th F.M. Complete, 14th to 16th M. Eruption, 7th to 9th M. Begins, Cuspid 5th F.M. Complete, 24th M. Eruption, 17th to 18th M. Begins, 1st Molar 5th F.M. Complete, 18th to 20th M. Eruption, 14th to 15th M. Begins, 2d Molar, 5th to 6th F.M. Complete, 20th to 22d M. Eruption, 18th to 24th M.

#### TEMPORARY TEETH.

Thirty-two in number.

Calcification

	Begins.	Complete.	Eruption.
Central	1st Yr.	10th to 11th Yr.	7th to 8th Yr.
Lateral	1st Yr.	10th to 11th Yr.	7th to 8th Yr.
Cuspid	3d Yr.	12th to 13th Yr.	12th to 13th Yr.
1st Bicuspид	4th Yr.	11th to 12th Yr.	10th to 11th Yr.
2d Bicuspид	5th Yr.	11th to 12th Yr.	11th to 12th Yr.
1st Molar	8th F.M.	9th to 10th Yr.	6th to 7th Yr.
2d Molar	5th Yr.	16th to 18th Yr.	12th to 14th Yr.
3d Molar	9th Yr.	18th to 20th Yr.	17th to 20th Yr.

First molars are often so decayed in children less than ten years of age, that if all the decay were removed the pulp would be exposed. In the great majority of such cases it is good practice to remove all the decay possible, and then cover the pulpal wall with a paste of oil of cloves and oxide of zinc and fill the remainder of the cavity with oxy-phosphate of zinc, and after the time for the full calcification of the root is passed, open the cavity and remove all the filling and any remaining decay, and if the pulp is clearly exposed devitalize it and insert a permanent filling. If there is no exposure, oxy-sulphate of zinc should be placed next to the pulp and over this the permanent filling. The same practice may be followed in the anterior teeth of the young. Many deep cavities in the young are so sensitive that it is impossible to properly excavate them, though the pulp is not exposed. These cases may be capped with oxide of zinc and oil of cloves and covered with oxy-phosphate of zinc for a few months or a year,



and then removed and a permanent filling inserted. During the time the test filling is in place the pulp will have been stimulated to throw out secondary dentine to protect itself. The decay can be removed with much less pain at this time. If hypersensitive cavities are filled with oxy-sulphate of zinc, mixed with thymol crystals and allowed to remain in place for a few weeks or months the decayed tissue can then be removed with less pain. Such a temporary filling may be covered with oxy-phosphate, if the cavity is large enough, and there is danger of dislodgment.

#### DISCOLORED DENTINE COVERING THE PULP.

If a permanent operation is intended, it is not good practice to leave any soft decay in a cavity, even if its removal would expose the pulp. Some authorities go so far as to say that no discolored dentine should be left in a cavity. The tendency of the present is to be more painstaking in removing decay than in the past. Some of the older writers on this subject advanced peculiar theories to support their views. Some went so far as to say that decalcified dentine would be recalcified under a capping of zinc chloride. No such views are held today, but many continue to cap exposed pulps with zinc chloride, believing that the irritation of the drug stimulates the pulp to throw out calculus salts to cover the exposure. The success of the practice, if it ever had any more, likely depended upon the disinfecting properties of the zinc chloride, which retained such capped pulps in an aseptic condition for a long time, even though they were dead.

The practice of removing all discolored dentine covering a pulp is equally unwise, besides being distressing to the patient. Every observer of the progress of decay in teeth has noticed streaks of discoloration reaching from a superficial attack of caries, which it would be very unwise to cut out. It must be borne in mind, however, that such discolored tissue has been influenced by the carious process. That part near the surface much more than that deeply located. There is a wide range between decalcified tissue which when removed is compressible, and the hard discolored tissue of the penetrating variety mentioned. It is safe practice to leave discolored dentine, covering a pulp, which is hard enough to give a distinct clink or ring to the instrument as it is cut. Such tissue is undoubtedly infected and contains waste products of bacteria which may be irritating to the pulp. The bacteria should be destroyed and the remains neutralized.

The bacteria may be destroyed by placing a paste of creosote or oil of cloves and oxide of zinc over the tissue, and over this inserted the permanent filling. Until more is known of the chemistry of the tomins in such issue little more can be done than what is suggested.

#### INTERMEDIATE FILLINGS.

There is a growing tendency among careful operators to place some non-metallic or plastic substance between the vital tissues of the tooth and a metallic filling. Not a few operators have followed the practice of placing oxy-phosphate or gutta-percha between amalgam or gold fillings and the tooth tissues. One of the important advantages of the gold or porcelain inlay is the intermediate cementing substance. The intermediate cementing substance does not conduct heat and cold as rapidly as the metal, and thus protects the pulp from shock. Besides the protection against changes of temperature, it protects the tooth pulp from a certain irritation that all metals have on living tooth structure. Every operator has noticed that some teeth are not comfortable under metal fillings for months after they are inserted, while in others there is little or no discomfort, and others again are never comfortable while a metal is in contact with the dentine. The author has more than once set up a violent pain by placing amalgam upon living dentine which was not relieved until every particle of the amalgam was removed and a soothing dressing inserted. It is a wise practice to place some non-conducting substance between every large metal filling and the dentine. This cannot be done with large gold fillings in the anterior teeth, but we welcome the fact that large gold fillings are not now necessary to preserve the anterior teeth.

#### ACCIDENTAL EXPOSURES.

Later in this chapter the author will lay down the general rule that an exposed pulp should be devitalized. This rule admits of a few exceptions. An exposure by decay is hopeless. An exposure by a clean instrument cutting sound dentine which does not destroy more than a square micron of the membrane of Eboris in a young patient may be looked upon as a favorable case for capping. If the instrument has wounded the pulp until there is a hemorrhage, a capping covered with a permanent filling is courting trouble. If the tooth is fully developed, the removal of such a pulp is imperative. It might have remained comfortable for cleanliness cannot be secured, results are proportionately less likely to give as long service as if the

pulp had been removed at once. Accidental exposures from clean instruments in teeth not fully developed should be capped. If perfect dryness and surgical cleanliness cannot be secured, results are proportionately less likely to be satisfactory. Dry the exposure, using alcohol and warm air. Apply to the exposed surface an aseptic non-irritating, easily adapted substance. The most suitable are the varnishes, such as benzo balsam, sundarac, copal or gutta-percha, dissolved in oil of cajeputi. If the exposure is clean when made, there is no need of applying strong disinfectants or cauterants. The varnish should be covered with oxy-sulphate of zinc if there is room; if not, oxy-phosphate of zinc. Accidental exposures are so rare with careful operators that they would not occur more than once or twice a year and when they do occur, fully 90 per cent of them ought to be immediately devitalized. This leaves the number to be capped very small.

#### FRACTURES OF THE TEETH.

Fractures of the teeth which immediately or subsequently involve the pulp are not infrequent. They usually occur in childhood or young adult life. They are more frequent among boys than girls, because boys play more hazardous games than girls and are generally more careless of their personal safety. The upper anterior teeth are more often involved than any others. Children often fall or have missiles thrown toward them which fracture one or more of their upper incisors. The fracture may not expose the pulp, but the shock is sufficient to cause it to die subsequently. In some cases the pulp dies from the irritation of the exposed dentine. If the pulp is not exposed by the fracture, the exposed dentine should be covered with oxy-phosphate of zinc, which should remain until there is an assurance that the pulp is not going to die from shock or irritation of the dentine. If the pulp has been but very slightly exposed in a tooth not fully developed an attempt should be made to retain the pulp alive until development is completed. If there has been much pain or protrusion of the pulp through the exposure, or more than a few hours elapsed since the accident there is little hope of success. Even slight exposures in mature teeth call for devitalization and all large exposures demand it.

#### TECHNIQUE.

Freshly exposed dentine becomes exceedingly sensitive in a few hours if the fluids of the mouth are in contact with it. This hypersensitive condition may be reduced to a normal state by dryness,

The rubber should be adjusted and the dentine dried with warm air. Applications of oil of cloves will help to protect the dentine from stimulation by the air. Phenol will cauterize the filaments of the tubuls and protect them from irritation. When the exposed dentine has been thus protected and dried with alcohol, thinly mixed oxy-phosphate will usually adhere to a fractured surface if no contour of the cement is attempted. If space will permit, the index finger may be covered with vaseline to hinder the cement from sticking, and after the cement is placed in position by an instrument, it may be pressed to place with all the force thus attainable. The adherence of a cement depends upon the accuracy of its adaptation to a finely irregular surface. If an exposure is to be treated, the method described under accidental exposures may be followed, except that complete disinfection is necessary, which may take twenty-four hours.

#### DEVITALIZATION OF THE DENTAL PULP.

As soon as it was discovered that many pains in and about the teeth were caused by the pulp, attempts were made to destroy its vitality. The early methods seem to us barbarous, but even with present methods there is great room for improvement. They do not cope satisfactorily with pulps which have been subject to paroxysms of pain from slight irritations for a long period. All the earlier methods were surgical and had been practiced for many years before the discovery of the action of arsenic on the pulp. Dr. Spooner, a dentist practicing in Montreal, Canada, was the first to discover the value of arsenic in the devitalization of the pulp. He found that the destructive action rarely, if ever, passed beyond the apex of the tooth. This was one of the greatest discoveries ever made in dentistry. It has made possible the restoration to usefulness of millions of teeth, which otherwise would have been lost, and has relieved more pain than many boasted general anaesthetics. The next advance in the method of devitalization of the pulp was the discovery of pressure anaesthesia by Dr. Funk, of Chicago, U. S. A.

The pulp may be devitalized by:

- (a) Surgery.
- (b) Poisons.
- (c) Anaesthetics.

Surgical methods of devitalizing the dental pulp have dropped into disuse since the introduction of arsenic for this purpose. A large exposure of the pulp was obtained and a wooden peg tapered to

approximately fit the canal, the point placed at the exposure and the peg driven into the canal with a hammer and turned around slightly to dislodge the pulp which usually came out with the wooden peg. Some practitioners employ this method in a modified form for removing the pulps from anterior teeth upon the roots of which are to be placed dowel crowns. A notch is cut on the labial and lingual surfaces of the tooth at the neck with a knife edge stone, into these notches are placed the blades of a pair of cutting forceps, when heavy pressure is applied on the handles of the instrument the tooth is snapped off at the neck, exposing the pulp. The pointed wooden peg is immediately driven into the pulp canal, rotated and withdrawn, and with it the pulp is likely to come. There is no pain in thus withdrawing the pulp. The shock of clipping off the tooth is so great that all sensation is lost in the pulp. Sensation returns in a minute or two. A barbed or hooked broach may be used to remove the pulp, instead of the wooden peg. Advantage may be taken of this period of anesthesia in the case of fracture of a tooth in an attempted extraction. A broach should be at hand in every case of extraction if the pulp is alive. If the pulp is immediately extracted there will be no pain for the present at least, if the root is allowed to remain, and if further attempts to remove the root are made the patient will be relieved of the pain of touching the exposed pulp.

Many poisons have been used for the purpose of devitalizing the dental pulp, but none have proved as satisfactory as arsenic. Though arsenic has many drawbacks, it stands today as the most universally satisfactory method. Cocaine anaesthesia stands easily in second place. Among the objectionable features of arsenic as a devitalizing agent are its irritating properties, its failure to act upon inflamed tissue, the possibility of destroying more tissue than desired, its tonic or destructive action on the pericemental membrane, its frequent failure to completely devitalize all of the pulp and the long time required for its action. Drugs which devitalize tissue by their cauterizing properties are too slow of action and mostly too irritating to be of much value. They do not penetrate, a property so essential in devitalizing tissue some distance from the point of application. Among such drugs are caustic potash, sulphuric acid, hydrochloric acid, nitric acid, chromic acid, zinc chloride, nitrate of silver, and phenol. Among these phenol is the least irritating, while the strong acids are more distinctive. These drugs are only used where there is danger of too

much destruction if arsenic is used, or where cocaine will not act. They have been highly recommended for the destruction of the pulps of deciduous teeth; like many another recommendation handed down from text-book to text-book, they are of little value. If the pulp of a deciduous tooth is to be devitalized, arsenic is the most satisfactory. There is no more danger in using arsenic where it is indicated in deciduous teeth than in permanent. The only requirement of the operator to safely use arsenic in deciduous teeth is a knowledge of dental anatomy and histology and the action of the drug.

This leads to a discussion of the action of arsenic when applied to living tissues. We are not here particularly concerned with whether arsenic devitalizes the pulp by congestion or by strangulation. It has been held in many long and cleverly written articles that arsenic caused the death of the pulp by creating an irritation which stopped or hindered the circulation of the blood in the veins. It has been as vehemently held that arsenic causes pulp to die by irritating the tissues until so much blood is forced into the pulp cavity through the fine opening at the apex, that the return circulation is cut off and the pulp is thus strangulated. For further discussion of this subject we refer the reader to works on therapeutics.

The power of arsenic to devitalize a pulp depends upon: (1) The quantity and purity of the drug; (2) the vitality of the tissue to which it is applied; (3) the thickness of tissue between the drug and the pulp; (4) the length of time it remains in contact with the vital tissues; (5) the physiological condition of the tissues to the devitalized. Each of these factors must be considered in every application of arsenic to devitalize a pulp. Success or failure depends more often upon the physiological or, perhaps, more often upon the pathological state of the tissue of the pulp than on anything else. The variations in the action of arsenic are so great that a sixtieth of a grain of the drug, if applied just beneath the enamel in a normal first molar, may devitalize the pulp in twenty-four hours, while the same quantity of the same drug may not devitalize the pulp of another tooth in the same mouth, though it be applied to the exposed pulp and left in position for three months. The cause for variation is most often due to the state of tissues of the pulp at the time of application. It is often sagely said that if a pulp is inflamed do not at once apply the arsenic, but reduce the inflammation and then make the application. The first difficulty is to make the diag-

nosis and the next to reduce or correct the inflammation. Every pulp which has pained is not inflamed and every inflamed pulp does not pain, and if the inflammation has gone on to a passive congestion, neither time nor drugs will correct it. Sometimes a free hemorrhage will cause the tissues to absorb the arsenic or an anaesthetic, but there are many pulps, and unfortunately they are the ones upon which drugs have the least effect, which will not bleed freely, and are the most sensitive to get at.

Since the action of arsenic on the pulp is so variable and depends upon so many factors no definite rule can be laid down for the quantity to be used or the time it should be left in position. If the application is made directly to a normal pulp, accidentally exposed of a young or middle aged patient, 1-100 of a grain of arsenic will devitalize it in twenty-four hours, while 1-20 of a grain may be applied to the dentine of a tooth with a pulp which has been hypersensitive to changes of temperature for months in the mouth of an old patient and be left for weeks with safety. Only general rules can be laid down for quantity, and time—1-100 to 1-20 of a grain. From twenty-four hours in incidious and immature teeth, to weeks in the aged and teeth with inflamed or partially deal pulps.

#### FORMS IN WHICH ARSENIC IS USED.

Arsenic as used for devitalization of the dental pulp is a fine white powder, which is sometimes adulterated with chalk. The powder may be mixed with antiseptic anaesthetic fluids, such as oil of cloves or creosote until a paste is made. A small quantity of this may be taken on a small round ended instrument and placed upon the desired spot in the cavity of the tooth to be treated. Some operators prefer to mix the powder at once to last for years. It is doubtful if arsenic retains its full devitalizing power if mixed for a long time. A small pledget of cotton may be moistened with creosote and then touched to the arsenic powder and carried to the cavity and sealed.

Pastes are made of arsenic, creosote, oil of cloves, cocaine and thymol. Instead of creosote or cloves, glycerine or lanolin may be used because these are solvents of arsenic. A small quantity of the paste is placed in the cavity of the tooth and then sealed.

The objections to all forms of pastes is the liability of their being squeezed out of the cavity in attempts at sealing. For several years arsenic pastes were used in the Royal College of Dental Surgeons, and it was no uncommon thing to have several cases of arsenical poisoning

for treatment every week. Since 1897, arsenical fibre has been used and cases of poisoning are so infrequent that many students graduate without having seen one. Arsenic fibre, when rolled up the size of a pin's head will contain sufficient arsenic to devitalize a pulp. For general use the fibre is the most satisfactory. It is convenient to handle, easily sealed in the cavity, does not tend to leak out of the cavity when sealing and is easily removed. The fibre should be sufficiently dry so that no fluid can be expressed from it in the act of sealing. It is made by working a short fibred cotton into one of the pastes.

#### METHODS OF APPLYING AND SEALING ARSENIC.

The method of application and the means of sealing depend largely upon the physiological state of the pulp, as gathered from the history of the case; the presence or absence of a cavity and its size and location.

Cavities of decay in teeth are the chief reason for the devitalization of the pulp. Cavities which are so deep that they endanger the vitality of the pulp are usually large enough to make the problem of application and sealing a simple one, but in cases where a great deal of the tissue of the tooth has been lost and the gum tissue has fallen into the cavity, as is frequently found in the disto-buccal surface of the lower third molar, the problem of application and sealing is a different one. It is often difficult on labial surfaces of the anterior teeth and, in excessive decay, combined with fracture in the bicuspid teeth. In the great majority of cases the application of arsenic is best made to the dentine in the cavity of the tooth, but if the cavity is so situated that the application cannot be made without the possibility of pressure on the pulp or leakage of the arsenic it is much wiser to drill a small hole through the enamel at a convenient location and in this pack the arsenic fibre and place a dressing of oil of cloves and phenol in the cavity where the pulp irritation occurred. This method will be found advisable in distal cavities of second molars and sometimes first and third molars. If the pulp has been paining it will soon subside and in three or four days the cavity may be fully excavated and if necessary an application made directly to the pulp which may need to be left in position for days. If a pulp has been paining, it is not wise to make the application directly to an exposure if it exists, nor is it wise to attempt to make an exposure unless the operator suspects an ulceration or abscess of the coronal portion of the pulp. If the pulp has not been paining and seems fully vital,



and exposed, or if it has been exposed surgically and bleeding freely, the application should then be made directly to the exposure, otherwise the application is better made to the vital dentine and, if possible, an anodine applied on or as near as can be to the pulp. Incisor teeth, and especially lowers, do not give much room for application and sealing. A very small quantity of arsenic should be used, and if there is room this should be covered with a small piece of cotton moistened with cloves and the whole covered with cement. If the over-hanging enamel of the cavity is not broken away any more than is necessary to gain access to the cavity, it will assist greatly in retaining the dressing. The chief cause of pain in the devitalization of a pulp with arsenic is pressure on the pulp and the application being made to semi-vital or infected tissue, when there is not an exposure of vital tissue. When applications are made directly to an exposure, the effort to effectively seal usually results in pressure, while if the application is made to the dentine and an anodine applied to the pulp, pressure is not so likely to be made in the application.

Leakage of arsenic most frequently occurs at the time of application. This is especially true in proximal occlusal cavities. The gingival wall of the cavity is often not sufficiently dry to insure adhesion of the sealing, and as it must be pressed to place from the occlusal opening after the arsenic has been placed there is every chance for its displacement, and if paste is used it is almost impossible to avoid its being squeezed out of the cavity. In the anterior teeth the application can, in the majority of cases, be made from the labial or lingual aspect, and in deep cavities a small portion of the sealing may be covered over the gingival wall of the cavity and the application made occlusal to this, and the balance of the sealing applied.

#### SEALINGS.

Almost every kind of plastic sealing material has been used and advocated to retain arsenical applications. Among the most favored are cement, gutta percha stopping, sandarac and cotton, chlora percha and cotton, wax and plain cotton. Each of these and others have their advocates. That material is most suitable which may be the most easily applied without pain, and will the most securely seal the application. Among these, cement takes first place for small cavities and cavities upon which mastication might dislodge a less strong sealing. For all cavities upon which little or no force of mastication can be applied and which are deep enough to retain it, sandarac and cotton

is most suitable. It is the most easily applied and most securely attaches itself to the tooth's surface. If arsenic fibre is to be sealed with sandarac and cotton it is well to cover the fibre with some substance which is insoluble in alcohol, so that the sandarac may not spread through the fibre and prevent it from coming in contact with the vital tissues. If glycerine or lanoline is used in the fibre, or if it is covered with a few shreds of cotton dipped in vaseline or creosote, cloves, phenol, there will not likely be any penetration of the cotton by the sandarac. Gutta percha may be used, but it does not usually become sufficiently plastic at a moderate temperature, and requires so much pressure to adapt it to the cavity wall that it is hard to avoid pressure on the pulp.

#### TEETH WITH FILLINGS.

If a tooth is filled and the pulp needs to be devitalized the opening to the pulp should be made, having regard to the convenience of getting access to the pulp and the strength of the tooth after such an opening has been made. Usually the nearest approach to a paining pulp in a filled tooth is through the filling, which can be removed with less pain than cutting through vital dentine. If an exposure exists under the filling or can be easily made, the pain can be at once relieved. If the pain is not severe and the location of the filling is not such as will give free access to the pulp, it is better practice to cut through the enamel to the dentine at the most convenient location and there apply the arsenic. If devitalization is advisable for any other reason than to relieve immediate pain, and the filling is in good condition, the only consideration left is the strength of the tooth, after a sufficient opening has been made to remove the pulp. If good proximal or proximo occlusal fillings exist in the incisors or cuspids it is generally advisable to open the pulp chamber from the lingual aspect. If bicuspid have double proximo occlusal fillings and the pulp chamber is opened from the occlusal either cusp will sooner or later break away. It is better in these teeth to gain access to the pulp through the mesial filling, even though it be perfect. Upper molars are best opened slightly, mesial to the central fossa, whether the filling is a good one or not. There is room in the molar teeth to cut into the pulp chamber from the occlusal without making the tooth so weak that it is liable to fracture. Lower molars may be opened in the mesio-occlusal cavities or fillings if the pulp must be removed to cut away the mesio-buccal cusp. This is especially advisable if the

tooth is tipped lingually or the cusp has been undermined by caries.

NO CAVITY OR FILLING.

If no cavity or filling exists and it is thought advisable to remove the pulp, the opening should be made at the point in the tooth's surface which will give the freest access to the pulp chamber and the root canals, and will at the same time not reduce the strength of the tooth any more than possible. Having regard for these factors the anterior teeth should be opened on the lingual surface just occlusal to the cingulum. If the teeth have been much worn by attrition, as sometimes occurs in the aged, the cutting edge may be selected as the point of opening; this is especially true in the lower incisors and **cuspid**s. When an opening on the lingual is used through which to remove the pulp, much care must be taken to remove all the pulp from the coronal portion of the tooth, otherwise discoloration of the tooth will occur.

If the pulp is alive, there is no need of cutting vital dentine to expose the pulp to apply the arsenic, all that is necessary is to cut a small opening through the enamel with a drill and pack this with arsenic fibre. In three or four days this may be removed and the dentine cut away without pain, to a sufficient depth to insure devitalization in forty-eight hours more. There are few cases in which pulps are so sensitive to thermal changes that it is impossible to either grind or drill a hole sufficiently deep to retain arsenic without causing severe pain. These cases are found in highly sensitive people who have pyorrhea, the neck of the tooth having been exposed for some years. The surface may be wiped off with cotton and a little piece of fibre placed against it, and over this put a pledget of sandarac and cotton, and tie the whole to the tooth by three or four rounds of floss silk. In a few days the surface will be so disensitive that an opening may be made deep enough to make a proper application.

Since arsenical application nearly always gives more or less irritation and sometimes gives the patient violent pain, it is wise to warn them that they may have some discomfort with the tooth for an hour or so, but if it becomes violent they should call for relief. With some experience the operator will be able to foretell if much pain is likely to occur. In cases of children and patients who are in a highly nervous state, it is well to tell some other member of the family of the possibilities of pain, otherwise they will give themselves and the dentist unnecessary annoyance.—*Dominion Dental Journal*.

DENTISTRY A FINE ART.

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In this era of natural science the art of healing has developed to a marvelous degree; science has gained a more intimate knowledge of the wonderful laws and harmony which underlie man's organism, and on which the precious possession of health depends. Hand in hand with this development has gone a finer appreciation of the value of the special departments of medicine and an increasing desire for more detailed knowledge of the complicated mechanism which unites the countless functions of the human body into that whole which we call life. In this imposing development of medical science as a whole, dentistry plays an honorable part; and indeed, long before our knowledge of the world begins, humanity had realized that the possession and preservation of sound, serviceable teeth was an important requisite of life. The dental art has already attained to a venerable age, an age, in fact, as venerable as that of medicine. The tombs of ancient Egypt, the clay tablets of pre-historic Assyrian civilization, teach us that even then beautiful teeth were an adornment dearly coveted by mankind. We note, too, that even in those early times skilful dentists practiced the art of filling teeth, and of making good their loss. This art, however, like everything else in this world, is subject to changes and fluctuations. The Romans held the skilful treatment of the teeth in high esteem; later, a decline set in in the dental art, which has only been revived in modern times as the result of zealous researches in natural science, leading, as elsewhere, to momentous discoveries in the field of dentistry. Science must not be an end in itself; it must exist for the benefit of all mankind. It must, especially at the present day, help to solve the great economic problems and the ever-increasing difficulties which beset the modern state. Medical science stands in close connection not only with the sociological defects of modern society but also with the efforts of the modern state to better the condition of the sick and the weak, and in this latter field dentistry plays its part. The undeniable progress in dental skill is proof that the dentists of today realize the duties and responsibilities resting upon them. Although the position of dentistry at the present day commands respect, and has been accompanied by an improvement in the social position of the dentist as well as by a corresponding advance in the requirements of dental study, many a

problem still remains unsolved. The masses of the people are ignorant of the fact that the care of the teeth is a preventive of decay; they sacrifice tooth after tooth and apply to the dentist only when it is too late to remedy the consequences of neglect. It is the dentist's province to enlighten the masses, and, in so doing, to share in the great work of preserving the health of the people.—EDITOR *British Dental Journal*.

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#### OPSONIC THERAPY (VACCINE TREATMENT) IN PYORRHEA ALVEOLARIS.

Pyorrhea is an infectious disease. Cultivation from pus shows principally a growth of pneumococcus, rarely mixed with staphylococcus and streptococcus. The opsonic findings yield almost always a low index to pneumococcus, somewhat low to staphylococcus, and practically normal to the other pathogenic organisms. The treatment of pyorrheal cases with vaccine, preferably autogenous, yields good results. Autogenous vaccine treatment is of course only possible when the disease has progressed to the stage of suppuration. The systemic affections, such as rheumatic pains, etc., possibly originating from the local infections, show marked improvement while under treatment with bacterial vaccines for pyorrhea.

The use of Lugol's solution (liquor iodi compositus) as a local application, either in full strength or diluted one-half or one-fourth with water, applied by the patient once or twice a day, is to be recommended as a good adjuvant to the vaccine treatment, always remembering that the iodine solution is nothing more than a good local antiseptic.—L. S. Medalia, *Journal of the Allied Societies*.

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#### REVISED LAW REGARDING PHYSICIANS AND DENTISTS IN JAPAN.

Vice-Consul General E. G. Babbitt of Yokohama reports that, according to the revised law, physicians shall not advertise in any way whatever concerning their ability, method of treatment, or previous career, except their professional degrees, titles, and specialties, and they shall provide a record book of services to patients, which must be preserved for at least ten years; the same rules apply to dentists. Commenting on the law, the *Japan Mail* says that "physicians, surgeons, dentists, and all who control hospitals or provide other means

of medical treatment, will not be allowed to advertise anything except their names, qualifications, localities, and charges."—*Medical Journal*.

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### CARBONIC ACID GAS AS AN ANESTHETIC.

When  $\text{CO}_2$  escapes under great pressure "snow" is formed. Under pressure in a tube, a solid carbon dioxide is produced.

This frozen gas acts as an anesthetic by freezing the skin similar to ethyl chloride.

Carbon dioxide, though normally a gas, is readily obtained in the solid state. For this purpose gaseous carbon dioxide is allowed to escape under great pressure from a cylinder, when carbon dioxide "snow" is formed. This may then be put into a tube and rammed tight, when a pencil of white solid carbon dioxide is obtained. The pencil can be pared like an ordinary pencil, and it can be held with comfort in the hand, provided it is wrapped round with one or two turns of cloth, although its temperature is below 80 degrees of Centigrade.

Carbon dioxide has of late had such an evil reputation in connection with gas stove fatalities that it is a pleasure to record something in its favor.

The pencil referred to above is, according to the University Correspondent, of great service in the treatment of certain skin affections. When its pared end is pressed, say, on a mole on the face, the mole and the skin immediately adjoining are frozen hard in about 30 seconds. The mole can then be cut out with practically no pain to the patient, and the scar heals quickly. "Port wine marks," warts and horny growths on the skin are also amenable to this treatment.—*Pacific Medical Journal*.

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### EMPHYSEMA.

Having recently seen one or two cases of subcutaneous emphysema about the mouth, gums, nose and eyes from accidental injection of air into the tissues, the writer desires to call the attention of the dental profession to this very definite condition and its proper designation. Many interesting cases will probably be recalled by most dentists when their attention is drawn to it. This accident is fortunately not rarely encountered and even when the phenomenon does occur, it subsides without treatment and need occasion very little

alarm on the part of the operator. By emphysema (from a Greek word meaning to inflate) we usually mean the entrance of air into the subcutaneous connective tissue spaces where air and gas is not normally present in any amount. When air is forced into the subcutaneous connective tissue from careless hypodermic injections, during violent coughing spells, fits of sneezing, penetrating wounds from fractured bone ends and even sometimes the most trivial accident, the condition is at once recognized by swelling of the tissues and by the fine crackling sensation felt under gentle pressure with the finger. Air thus admitted may extend over a considerable area always, however, giving a peculiar crackling sensation of crepitation which is pathognomonic. A distinction between inflammatory oedema and true emphysema will be made with ease. Inflammatory oedema does not crackle under the finger; is quite tender and painful and there is also the history of slower onset following infection. No active treatment is needed for emphysema as has been said, and it soon subsides as the air escapes. The condition may be encountered in almost any part of the body.—H. G. Langworthy, M. D., Dubuque, Iowa.

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#### OPINIONS REGARDING SILICATES.

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The rubber dam is adjusted on a sufficient number of teeth to have plenty of room to work and see well what you are doing. After cavity is prepared it is wiped out with alcohol, followed by air blast. Before filling with the silicate I line cavity with an oxyphosphate cement.

I arrange two slabs side by side with powder and liquid on them ready for use. First I mix the oxyphosphate and flow a thin film over the floor and walls of the cavity. I use Klewe & Co.'s Porcelain Inlay Cements, which are very finely ground and when mixed quite thin do not leave a line of demarkation between the enamel filling and the tooth, and besides it sets slowly and gives plenty of time to mix the enamel.

I have always found it a very hard thing to do, indeed it is often difficult to get the cement to the bottom of a cavity without having it run up the instrument or dragging it off on the margins. In this work if your cement was inclined to set quickly or stiffen quickly you would never succeed in getting the walls covered, as I have discovered when getting it a trifle thick.

I mix the enamel and putting a little of it on the point of a metallic instrument, which I like very much for the purpose, I pack it quickly. Then with enough enamel to more than fill the balance I bend a celluloid strip over it and draw down quickly and remove instantly so as not to let it stick, at the same time hugging it tightly, especially at the cervical margin, for there is where it is hard to finish, especially if the teeth are close together.

It is a good idea to wipe a thin film of vaseline on the celluloid strip to prevent it from sticking.

Just here let me caution you not to fuss with it after it is packed and drawn into shape. I always wait not less than ten minutes before commencing to finish it. That gives both cements time to crystallize pretty well, and will overcome the possibility of dislodging it or injuring the margins. To finish and polish I use the cuttlefish discs, one-half inch regular grit and one-half inch fine grit, which is really no grit at all. I have tried the celluloid discs, but don't like them for fear of cutting the rubber dam. For final finish I draw a smooth strip across a cake of paraffine, then vigorously use it on the filling.

Finally I cover the filling with liquir court plaster or its equivalent called Cavatini, which is sold at the dental depots. This will dry quickly, but a blast of warm air will help. In removing the rubber dam I first cut it where it goes between the teeth so as not to peel off the varnish.

As no vaseline is used it is, of course, unnecessary to wipe off the filling with alcohol.

In the original directions where vaseline was advised, wiping off the filling with alcohol was a part of the program. To me that always seemed like a dangerous thing to do, especially after great care had been taken to keep away moisture of any kind.

I keep a strict record of the shade used, as well as the color of the cement, so at a later date if I wished to fill an adjacent tooth I would know whether to use the shade I used before or another.—  
*Edgar Y. Lewis, in Dental Register.*



## IF.

If you can keep your head when all about you  
Are losing theirs and blaming it on you;  
If you can trust yourself when all men doubt you,  
But make allowance for their doubting, too;  
If you can wait and not be tired by waiting,  
Or being lied about don't deal in lies,  
Or being hated don't give way to hating,  
And yet don't look too good, nor talk too wise;

If you can dream, and not make dreams your master;  
If you can think, and not make thoughts your aim;  
If you can meet with triumph and disaster  
And treat those two imposters just the same;  
If you can bear to hear the truth you've spoken  
Twisted by knaves to make a trap for fools,  
Or watch the things you gave your life to, broken,  
And stoop and build 'em up with wornout tools;

If you can make one heap of all your winnings  
And risk it on one turn of pitch-and-toss,  
And lose, and start again at your beginnings  
And never breathe a word about your loss;  
If you can force your heart and nerve and sinew  
To serve your turn long after they are gone,  
And so hold on when there is nothing in you  
Except the will which says to them "Hold on!"

If you can talk with crowds and keep your virtue,  
Or walk with kings, nor lose the common touch;  
If neither foes nor loving friends can hurt you,  
If all men count with you, but none too much;  
If you can fill the unforgiving minute  
With sixty seconds' worth of distance run;  
Yours is the earth and everything that's in it,  
And—which is more—you'll be a *man*, my son!

—RUDYARD KIPLING, in *American Magazine*.

# WHO'S WHO AND WHY.

[Under this title the journal will devote some space to acquainting its readers with the presidents of state dental, and important local societies; and treat of such other distinguished dental practitioners as the personal news items merit. By this means the readers are brought into a closer relationship with the leading spirits of their profession, and a better understanding can grow out of such an acquaintance.—EDITOR.]

**THOMAS A. BROADBENT, D. D. S.**

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Secretary National Association of Dental Examiners.

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Thomas A. Broadbent is a native of Illinois. He attended the grammar school, high school, and graduated from Knox College in 1885. In 1887 he graduated from the Chicago College of Dental Surgery; began practice in Chicago; taught for four years in the Chicago College of Dental Surgery; held the chair of Dental Surgery for three years in the College of Physicians and Surgeons. He is active in dental society work and is a member of Chicago Odontographic Society, Illinois State Dental Society; secretary Illinois State Board of Dental Examiners; secretary National Association of Dental Examiners; member Chicago Athletic Association, Ravenswood (Chicago) Club, Edgewater Golf Club, Past Master Lake View lodge No. 774, A. F. and A. M.; Past High Priest of Lincoln Park chapter No. 177, R. A. M.; P. T. I. M. Chicago council No. 4, R. & S. M.; member Apollo commandery No. 1, K. T. Has resided in Chicago since 1887. He is of the progressive attitude in matters pertaining to better relationship between state dental boards; and his elevation to national secretary, places him in a position where great good can come in harmonizing the state laws and making the profession a more dignified, legalized calling.

Dr. Broadbent was born in Henry county, Illinois, on September 29, 1863, and when he was twenty-four years old married Miss Clara Totter; they live at 4410 North Hermitage avenue, and have three children, Robert, Donald and Grant. The doctor will write an article on "Dental Law Reforms," which will appear in the near future.



THOMAS A. BROADBENT, D. D. S.



# PRACTICAL SUGGESTIONS.

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## WASHING OUT THE WAX FROM VULCANITE FLASKS.

Wire net strainers, for sale by dealers in housekeeping supplies, are useful aids in washing out vulcanite flasks preparatory to packing. They come in various styles and sizes. Place the flask in one of these and it is readily handled in boiling water. Should a tooth be displaced it is caught in the net. They are inexpensive.—*T., in Dental Brief.*

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## TREATMENT OF METALLIC STAINS.

The metallic stains found in the dentin are best removed by transforming the insoluble metallic salt into a soluble one. The most frequent and practicable course is to form soluble chlorid through the action of nascent chlorin. Copper, nickel, gold and iron stains should be subjected to the chlorin method of bleaching, followed by repeated washing with chlorin water, fifty per cent, and hot distilled water to remove the chlorid formed. For mercurial stains Kirk recommends the use of aqueous ammoniacal solutions of hydrogen dioxid after the chlorin method, followed by washing with hot distilled waer.—*M. B. Long, in Penn Dental Journal.*

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## A FORMULA FOR A MOUTH WASH.

A very good mouth wash may be made by adding to one can of talcum powder five drops of oil of wintergreen, cloves or cinnamon (cinnamon preferred). Mix thoroughly in a large mortar. Then add a pint of lukewarm water. Stir for a few minutes and add five drops of formalin. Stir again. Then filter and dilute to suit.

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## ALL-PORCELAIN CROWNS.

The weak portion of an all-porcelain crown or dummy is the lingual portion and where the bite is very short they should not be employed. In the majority of cases, however, the bite is of sufficient length to warrant their use and unless the bite is rather extreme length, the lingual of these all-porcelain teeth should be supported by letting the metal come up well around this surface. This applies especially to dummies in bridgework.—*R. E. MacBoyle, Chicago.*

**BLEACHING PINK RUBBER.**

Bleaching pink rubber may be accomplished by focusing upon it the rays of a magnifying glass, taking care, however, not to burn it. This method will produce a beautiful bleached pink rubber in about five minutes.—*C. C. Markey, Chicago in Dental Review.*

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**WASHING OUT THE WAX FROM VULCANITE FLASKS.**

Wire net strainers, for sale by dealers in housekeeping supplies, are useful aids in washing out vulcanite flasks preparatory to packing. They come in various styles and sizes. Place the flask in one of these and it is readily handled in boiling water. Should a tooth be displaced it is caught in the net. They are inexpensive.—*T.*

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**ANCHORING IN CAST GOLD INLAYS.**

We see but too often the failure on the part of the dentist to be able to obtain sufficient anchorage for a gold filling in cases where a corner of an anterior tooth has broken away. The cutting edges of such teeth are often so narrow that anchorage along them is impossible, and when anchor screws are used the gold frequently breaks away.

In cases of this kind I have resorted to the gold inlay, as follows: First obtain a good separation of the teeth by wedging. After preparing the cavity with an undercut toward the cervix at right angles to the incisal edge, and so that the wax will draw easily, and after smoothing the margins, make a model of the wax and cast an inlay of pure gold in the usual way. After obtaining the proper seating of the inlay in the cavity, anchor a long anchor screw wire into the dentin at right angles to the long axis of the tooth. For anchoring the screw wire, I do not depend upon the thread entirely, but use a thin mix of inlay cement when seating the wire. The cement also prevents discoloration. After cutting the wire to the right length, I drill a hole into the inlay to admit the wire, and make a small dovetail at the bottom of the hole. It is sometimes necessary to make a groove from the hole toward the cervix to allow the passage of the wire when seating. This groove can be dovetailed. The inlay is then properly adjusted and cemented into place.

This method makes a very strong and beautiful restoration of the broken tooth.—*B. T. Mason, in Garretsonian.*

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**TO CLEANSE BARBED BROACHES.**

Lay broach on a wooden block having a plane surface and use

a stiff bristle brush moistened in alcohol or water; brushing "with" the barbs (not against them), will quickly dislodge all debris and will not injure the barbs. They may then be sterilized by boiling, or disinfected by any of the ordinary disinfecting solutions, and placed in a clean box with a closely fitting cover, and are then ready for immediate use when needed.—*P. G. Puterbaugh.*

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#### MAKE YOUR OWN INLAY INVESTMENT.

An excellent investment material is made by: One part plaster paris, one part fine powdered silix, one part hard coal ashes. The silix should be very fine; and the hard coal ashes should be sifted very fine, select ashes that are free from unburnt particles of coal, measure by bulk. A good way to mix this is by putting in a stiff paper bag and shake it like you would a mixture in a bottle. I have used every investment that I have heard of but find this the best in every respect.—*W. F. Reber.*

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#### THE SUBJECT OF SYPHILIS.

Is one that is of interest to both medical and dental practitioners alike, for during the course of syphilis at some time or another it is almost certain to manifest itself by symptoms in the oral cavity. Indeed, the symptoms as they appear in the mouth may be the first for which the person affected seeks relief or advice, either from his physician or dentist, and a certain degree of familiarity with the clinical appearances of the disease, as it presents itself in the oral cavity, at least, should be the possession of every dentist. I trust the time is not far distant when every course in dental surgery will include an exposition of the subject of syphilis in its relation to dentistry.—*O. H. Forester, Milwaukee, Wis.*

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#### THE REQUISITES OF A SUCCESSFUL CROWN ARE:

A good adaptation to root with reference to peripheral continuity and root-end apposition in dowel crowns, freedom from periodontal impingement, close contact with approximating teeth, at the same time preserving proper interproximal space gingivally, correct occlusion, anatomical form and alignment with adjacent teeth, adequate strength and compliance with the cosmetic requirements. The same may be said of the bridge, with the additional observance of the gen-

eral rule that the number of dummies supplied should not exceed the number of abutments and piers. Assuming, of course, that the preliminary requirements of healthful conditions have been established.

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#### LITTLE INSTRUCTION IS GIVEN IN ECONOMICS TO THE STUDENT IN DENTISTRY.

Little instruction is given in economics to the student in dentistry while preparing for his life work. A very few schools do attempt training in this useful branch, but the number is so few that it is almost a negligible quantity. A student should not be turned out to commence his life work without giving him knowledge of practice building and some instruction as to a scientific method of making charges for his services. Few dentists ever fully learn the latter. To be highly qualified to practice one's profession, and at the same time have a financial sense, does not, in my opinion, necessarily constitute a dual existence. The two combined give the superior man. They are a combination forming, when properly adjusted, a perfect whole. Continuous growth, mentally, demands remuneration to give opportunity for better facilities for this growth.—*T. L. Gilmer, Chicago.*

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#### HOW TO OVERCOME THE BRITTLINESS OF GOLD IN CASTING.

If gold other than pure be used in casting, it will be found to be brittle. This may be overcome by plunging the gold into a saturated solution of salt water, drying over a flame and melting and casting as usual.

The salt water acts as a flux and will overcome the brittleness, which is the objection to scrap gold in bridge work.—*C. S. Starkweather, Dental Summary.*

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#### TO TIGHTEN A VULCANIZER.

Ordinary newspaper is boiled for from five to ten minutes until it has become quite soft, and is pressed in this condition into the groove of the lid on the old leaky ring. The lid is then screwed on tightly. After the vulcanizer is used once, this paper mass is quite hard and tightens perfectly. Any excess of paper mass is cut off.—*Deutsche Zahnärztliche Wochenschrift.*



# ANNOUNCEMENTS.

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## **IOWA BOARD OF DENTAL EXAMINERS.**

The Iowa State Board will hold a meeting for the examination of candidates for license to practice dentistry in Iowa, beginning December 5th, 1910, at 9:00 a. m., in Des Moines.

For blanks and other information, write the secretary, E. D. Brower, Le Mars, Iowa.

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## **THE MICHIGAN STATE BOARD OF DENTAL EXAMINERS.**

The next regular meeting of the Michigan State Board of Dental Examiners will be held at Ann Arbor, Nov. 16 to 19, inclusive. A. W. Haidle, secretary, Negaunee, Mich.

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## **THE G. V. BLACK CLUB CLINIC.**

The G. V. Black Dental Club of St. Paul will hold a Midwinter Clinic in February, 1911. It is our intention to make this meeting the most interesting and profitable of all which we have held.

A cordial invitation is extended to the members of the profession to attend and assist us in making this meeting the best that has ever been held in the northwest.

Dates and program will be published later.

For further information address, R. B. Wilson, secretary, Am. Nat. Bank building, St. Paul, Minn.

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## **ILLINOIS STATE BOARD OF DENTAL EXAMINERS.**

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held at the University of Illinois (dental department), corner Harrison and Honore streets, beginning Monday, Nov. 7th, 1910, at 9 a. m. "The following preliminary qualifications shall be required of candidates to entitle them to examination by this board for a license to practice dentistry in the State of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year 1906-7, must have a minimum preliminary education of not less than graduation from an accredited high school or a certificate from the State Superintendent of Public Instruction, equivalent officer or deputy, acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high school diploma." Candidates will be furnished with proper blanks and such other information as is necessary, on application to the secretary. All applications must be filed with the secretary five (5) days prior to date of examination. The examination fee is twenty dollars (\$20) with an additional fee of five dollars (\$5) for a license. Address all communications to T. A. Broadbent, secretary, 705 Venetian building.

# PUBLISHERS' CORNER

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Did it ever occur to you that the advertising in the *AMERICAN DENTAL JOURNAL* is just as important, in its way, and just as interesting and educational as the regular reading matter? To be sure, the advertisement that appeals to your neighbor may not interest you at all, but isn't this just the same with the editorial matter? What interests you may be of no concern whatever to your neighbor. Now, don't shake your head and say that we are talking illogically, for we are not; and we want you to listen while we explain just what we mean.

Let us suppose, for instance, that you live in some small town out in the country. It makes no difference if you live right in the heart of a great big city, and you, as a subscriber, must be one of these two. It is a fact that the large majority of the profession rarely, if ever, go to the dental houses themselves; probably not more than two or three times a year. The reason for this is that they either are situated in a town far remote from the dental depot, or if in a town where the dental depot is, they are usually too busy and depend on sending their office girl or laboratory man, or on the regular traveling representative.

It may so happen that a firm, say in Boston, is introducing a new material or device of some kind which would be a great convenience to you in your practice, or something of a nature that would be exactly what you had been wanting for a long time.

Now there is a chance for you to get just what you want, but how in the world are you going to know about it when you don't go to Boston or when the regular representative does not call it to your attention, or does not have it with him to show you in your office? There is only *ONE WAY*, and that way is to *READ THE ADVERTISEMENTS IN THIS JOURNAL*. That's the way to find out about these things. We honestly believe that no dentist who subscribes for a journal gets his money's worth unless he does read the advertisements.

But you say, "I don't know these concerns; I don't know whether they will do as they promise." Doctor, let us set your mind at rest. We, the publishers of this journal, guarantee the reliability of every concern whose advertisements appear in these columns. You may rest assured that you will be protected from loss in any of your dealings with any of our advertisers. If you have any cause for complaint at any time, write us about it.

Take our word for it—the habit of reading advertisements is a pleasant and a profitable one. **BEGIN WITH THIS ISSUE.**

—*The Publishers.*

# EVERYBODY'S CORNER.

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**Stewart-Hays.**—Dr. C. H. Stewart, a popular young dentist in Shepandoah, Iowa, was married October 3d to Miss Ethel Mae Hays.

**No Trace of Missing Dentist.**—As yet no trace of Dr. Harry S. Hanson, the dentist who disappeared September 18th, has been found.

**Overdose of Potash.**—Dr. A. J. Bradford, a well known dentist in Butler, Kentucky, died October 1st as the result of an overdose of potash taken by accident. He is survived by a widow and two children.

**Dentist Killed.**—Dr. Francis Marion Reynolds, 80 years old, a retired dentist of Oak Park, was struck and instantly killed by a train September 29th. He is survived by a son and two daughters.

**Dentist Injured.**—Dr. Clark, a practicing dentist in Charles City, Iowa, while doing some dental work recently, had the misfortune to have a piece of enamel from a tooth fly and hit the left eye ball, making a wound in the ball of the eye that has been very painful.

**"Toothbrush Plant."**—One of the most curious plants in the world is what is called the toothbrush plant of Jamaica. It is a species of creeper, and by cutting pieces of a suitable length and fraying the ends the natives convert it into a tooth-brush, and a tooth powder to accompany the brush is also prepared by pulverizing the dried stems.

**Dentist Office Robbed.**—Dr. W. O. Vallete, a dentist in Goshen, Ind., is out about \$100.00 as the result of the work of a sneak thief. No clue was left, but the thief was evidently some one familiar with dental offices for he apparently knew just where to look and took only that which could easily be realized upon.

**Grows Teeth at 83.**—Watson Baker, 82 years old of Lynn, Mass., is proudly calling attention to the fact that he has just grown two new teeth at an age when most men are toothless. These teeth are the beginning of a new set and Mr. Baker is confident he will have a beautiful set. All his second teeth are double and the new teeth of the third set are also double.

**Dentist Victim of Graft.**—A smooth graft was worked October 1st on Dr. C. S. Wilson, a well known dentist in Lamar, Col. A young man giving the name of Glass appeared in the office, representing that he was attending a prominent Eastern dental school, but having been out West had become nearly stranded and the doctor was solicited for a loan of \$5.00. When the train departed, however, it was observed that the young man went west instead of east. The dentist telephoned a dentist friend in La Junta and found the dentist in conversation with the same swindler, who became suspicious and left the office.

A decorative banner with ornate, symmetrical scrollwork at both ends. The banner is white with a black border, and the text "IN MEMORIAM." is printed in a bold, black, serif font in the center.

## IN MEMORIAM.

**Dr. George R. Major**, a practicing dentist in Bellevue, Kentucky, died suddenly September 23d. He had been in ill health for some time. His condition was not thought serious, however, and preparations were being made by him and family for a trip to California to spend the winter. He was a member of both the lodge and encampment of Odd Fellows. He is survived by a widow and two children.

**Wanted****For Sale****Exchange**

**NOTE:**—Advertisements in this Department not exceeding fifty words will be published free for three insertions for subscribers whose subscriptions have been paid for one year in advance.

Advertisements under regular heading from non-subscribers will be inserted for a charge of five cents per word. Remittance in full must accompany such copy.

Copy must be on file in our office by the 15th of the preceding month in which insertion is desired.

**In answering these advertisements** through the American Dental Journal, enclose your answer in **stamped envelope** with the advertiser's letters marked on the corner. **No unstamped letters will be forwarded.**

We are not responsible for any advertisement appearing in these columns.

**PUBLISHERS.**

**FOR SALE**—Best located advertising practice and a well equipped office in city of sixty thousand, in Nebraska. Practice last year, twelve thousand. Reason for selling will satisfy you. If you mean business, address "Bargain," care of American Dental Journal, 39 State street, Chicago, Ill.

**FOR SALE**—One of the best dental practices on the western slope of Colorado, noted for its health and climate, in heart of the great fruit region, full electric equipment, a bargain if taken by December 1st, 1910. Good reason for selling. Address Box No. 822, Grand Junction, Colo.

**FOR SALE**—At invoice, a dental practice in city of six thousand inhabitants in eastern Illinois. Practice, \$2,000 per year. Will give terms. Address "Bargain," care of American Dental Journal, 39 State street, Chicago.

**FOR SALE**—Dental practice and outfit, and household outfit; former invoices \$450.00, latter \$500.00, will sell separately. Any reasonable offer accepted. No other dentist, growing town, New York State. Reason: Owner already established in Mexico. Address Apo 143, Saltillo, Coah., Mexico.

**FOR SALE**—Clarke double bowl glass fountain cuspidor in good condition, tubing good but slightly faded. Price, \$20.00. Address "Fountain," care of American Dental Journal, 39 State street, Chicago.

**WANTED** — Second-hand operating outfit with chair, cabinet, instruments and brackets. Address Dr. J. H. Jones, Parma, Mich.

**FOR SALE**—\$7,000 dental practice. This is the finest location and one of the best equipped offices in downtown Chicago. Sell at invoice for cash, \$1,250. Other business. Address "C. Q. D.," care of American Dental Journal, 39 State street.

**WANTED**—A second-hand Elgin Vacuum Casting Appliance. Must be in good working order. Address, Dr. D. J. Kuns, Marseilles, Ill.

**WANTED**—Position by capable manager of fifteen years' experience in advertising office. Would consider purchasing interest in the business. Any dentist wishing to enter into the advertising business please correspond with "Manager," care of American Dental Journal, 39 State street, Chicago.

## PYORRHEA

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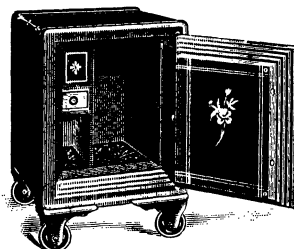
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